SANDAG

the 2021 regional plan

FINAL ENVIRONMENTAL IMPACT REPORT

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<u>FINAL</u> ~~DRAFT~~ ENVIRONMENTAL IMPACT REPORT
SAN DIEGO FORWARD:
THE 2021 REGIONAL PLAN

State Clearinghouse #: 2010041061

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Lead Agency:

San Diego Association of Governments (SANDAG)
401 B Street, Suite 800
San Diego, CA 92101

Contact:

Kirsten Uchitel, Associate Planner
(619) 699-7335
Kirsten.Uchitel@sandag.org

Consultants to SANDAG:

ICF
525 B Street, Suite 1700,
San Diego, CA 92101

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Acronyms and Abbreviations

Acronym	Definition
µPa	microPascals
2013 Master Plan Update	2013 Regional Water Facilities Optimization and Master Plan Update
2016 SIP	2016 Eight-Hour O3 Attainment Plan
2020 SIP	2020 Plan for Attaining the National Ozone Standards
2050 RTP/SCS	2050 Regional Transportation Plan/Sustainable Communities Strategy
AB	Assembly Bill
ABM2+	second generation Activity Based Model
ACM	asbestos-containing materials
ADA	Americans with Disabilities Act
ADAM	Aerometric Data Analysis and Management
ADP	Airport Development Plan
ADRP	Archaeological Data Recovery Program
AFVs	alternative fuel vehicles
AIA	Airport Influence Area
AICUZ	Air Installations Compatible Use Zones
Airport Authority	San Diego County Regional Airport Authority
ALUC	Airport Land Use Commission
ALUCP	Airport Land Use Compatibility Plans
AMI	Area Median Income
AMSL	above mean sea level
APZ	Accident Potential Zones
AQIA	Air Quality Impact Analysis
AQMP	Air Quality Management Plan
AR4	IPCC Fourth Assessment Report
ASBS	Areas of Special Biological Significance
ATDM	Active Transportation and Demand Management
ATP	Active Transportation Program
Basin Plan	Water Quality Control Plan for the San Diego Basin
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
Bike Plan EAP	Regional Bike Plan Early Action Program
BLM	Bureau of Land Management
BMO	Biological Mitigation Ordinance
BMPs	best management practices
BNSF	Burlington Northern Santa Fe

Acronym	Definition
BTU	British thermal unit
BWD	Borrego Water District
C&D	Construction and demolition
CAA	Clean Air Act
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFE	Corporate Average Fuel Economy Standards
CAFÉ	Corporate Average Fuel Economy Standards
Cal EMA	California Emergency Management Agency
CAL FIRE	California Department of Forestry and Fire Protection
Cal OES	California Office of Emergency Services
CalEPA	California Environmental Protection Agency
CALGreen	California Green Building Standards Code
Caltrans	California Department of Transportation
CAO	Cleanup and Abatement Order
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CAPP	Community Air Protection Program
CAPs	Climate Action Plans
CARB	California Air Resources Board
CBC	California Building Code
CCA	California Coastal Act
CCA	Clean Air Act
CCAA	California CAA
CCC	California Coastal Commission
CCR	California Code of Regulations
CDC	California Department of Conservation
CDFW	California Department of Fish and Wildlife
CDO	Cease and Desist Order
CDP	Coastal Development Permit
CEC	California Energy Commission
CEPAM	California Emissions Projection Analysis Model
CEQA	California Environmental Quality Act
CERP	Community Emissions Reduction Program
CESA	California Endangered Species Act
CFA	County Fire Authority
CFCP	California Farmland Conservancy Program
CFGC	California Fish and Game Code
CFLA	California Forest Legacy Act

Acronym	Definition
CFR	Code of Federal Regulations
CH_4	methane
CHHSLs	California Human Health Screening Levels
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CMCPs	Comprehensive Multimodal Corridor Plans
CMH	Central Mobility Hub
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COCs	contaminates of concern
COG	Council of Governments
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank Species:
CSP	carryover storage component
CTC	California Transportation Commission
CUPA	Certified Unified Program Agency
CVEG	Commercial Vehicle Enforcement Facility
CWA	Clean Water Act
CWP	California Water Plan
CZMA	Coastal Zone Management Act
DAA	Disaster Assistance Act
DARs	Direct Access Ramps
dB	decibel
dBA	A-weighted decibels
DEH	Department of Environmental Health
DMA 2000	Disaster Mitigation Act of 2000
DMG	Division of Mines and Geology
DMU	diesel-multiple unit
DOC	State of California Department of Conservation
DOD	Department of Defense
DOF	Department of Finance
DOT	U.S. Department of Transportation
DPM	diesel particulate matter
DPR	Department of Pesticide Regulation

Acronym	Definition
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EAP	Regional Bike Plan Early Action Plan
ECCs	emerging chemicals of concern
EDD	Economic Development Department
EDF	Environmental Defense Fund
EFH	Essential Fish Habitat
EHRA	Earthquake Hazards Reduction Act
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
Emergency Plan	Unified San Diego County Emergency Services Organization and County of San Diego Operational Area Emergency Operations Plan
EMFAC	Emission Factor
EMP	Environmental Mitigation Program
Enforcement Program	DTSC Enforcement and Emergency Response Program
EO	Executive Order
EOs	Executive Orders
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Environmental Site Assessment
ESHA	Environmentally Sensitive Habitat Area
ESL	Environmentally Sensitive Lands
ESP	Emergency Storage Project
EV	electric vehicle
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHSZ	Fire Hazard Severity Zones
FHWA	Federal Highway Administration
FIRM	Federal Insurance Rate Map
FMCSA	Federal Motor Carrier Safety Administration
FMMP	Farmland Mapping and Monitoring Program
FMP	Floodplain Management Plan
FMP	Fisheries Management Plan
FPDs	Fire Protection Districts
FPPA	Farmland Protection Policy Act
FR	Federal Register

Acronym	Definition
FRA	Federal Railroad Administration
FRAP	Fire and Resource Assessment Program
FSZ	Farmland Security Zone
FTA	Federal Transit Administration
FTIPs	Federal Transportation Improvement Programs
FUDS	Formerly Used Defense Sites
GHG	greenhouse gas
GIS	geographic information system
GSAs	groundwater sustainability agencies
GSP	Groundwater Sustainability Plan
GVWR	gross vehicle weight rating
GWP	global warming potential
HAPCs	Habitat Areas of Particular Concern
HAPs	hazardous air pollutants
HAs	hydrologic areas
HCD	Housing and Community Development
HCPs	Habitat Conservation Plans
HFCs	hydrofluorocarbons
HLP	Habitat Loss Permit
HMD	Hazardous Materials Division
HMGP	Hazard Mitigation Grant Program
HMMP	Habitat Mitigation and Monitoring Plan
HMP	Hydromodification Management Plan
HMP	Habitat Management Plan
HOV	high-occupancy vehicle
hp	horsepower
HSAs	hydrologic subareas
HSC	Health and Safety Code
HSRA	High-Speed Rail Authority
HST	High Speed Rail Train
HUs	hydrologic units
HVAC	heating, ventilation and air conditioning
Hz	hertz
I-15	Interstate 15
I-5	Interstate 5
I-8	Interstate 8
ICAPCD	Imperial County Air Pollution Control District
ICM	Integrated Corridor Management
IID	Imperial Irrigation District

Acronym	Definition
in/s	inches per second
in/s^2	inches per second per second
INRMPs	Integrated Natural Resource Management Plans
IPCC	Intergovernmental Panel on Climate Change
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
ITS	Intelligent Transportation Systems
IWMP	Integrated Waste Management Plan
JURMP	Jurisdictional Urban Runoff Management Program
kHz	kilohertz
kW	kilowatts
LAFCO	Local Agency Formation Commission
LAMP	Local Agency Management Program
LBP	lead-based paint
LCFS	Low Carbon Fuel Standard
LCP	Local Coastal Program
LDV	light-duty vehicles
LEA	Local Enforcement Agency
LEED	Leadership in Energy and Environmental Design
L_{eq}	equivalent sound level
LFPZ	Levee Flood Protection Zone
LHP	Landslide Hazard Program
LID	Low Impact Development
L_{max}	Maximum Sound Level
L_{min}	Minimum Sound Level
Local Register	San Diego County Local Register of Historical Resources
LOS	Level of Service
LOSSAN	Los Angeles–San Diego–San Luis Obispo
LQGs	large-quantity generators
LRA	Local Responsibility Areas
LRT	Light Rail Transit
LTMP	Long-Term Management Plan
LUST	leaking underground storage tank
LV	Vibration Velocity Level
L_{xx}	Percentile-Exceeded Sound Level
M&I	municipal and industrial
MAP	Mitigation Action Plan
MAP-21	Moving Ahead for Progress in the 21st Century Act
MBTA	Migratory Bird Treaty Act

Acronym	Definition
MC	Municipal Code
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCRD	Marine Corps Recruit Depot
MDPV	medium-duty passenger vehicles
MEIR	maximally exposed individual receptor
MGD	million gallons per day
mgd	million gallons per day
MHCP	Multiple Habitat Conservation Program
MHPA	Multi-Habitat Planning Area
ML	Managed Lanes
MLDs	Most Likely Descendants
MLs	Managed Lanes
MMPA	Marine Mammal Protection Act
MMRP	Mitigation Monitoring and Reporting Program
MMT	million metric tons
MOU	Memorandum of Understanding
MP	Mile Post
mpg	miles per gallon
mph	miles per hour
MPO	Metropolitan Planning Organization
MPOs	Metropolitan Planning Organizations
MPRSA	Marine Protection, Research, and Sanctuaries Act
MRFs	material recovery facilities
MSATs	Mobile Source Air Toxics
MSCP	Multiple Species Conservation Program
MSHCP	Multi-Species Habitat Conservation Plan
MSP	Management Strategic Plan
$MTCO_2e$	metric tons of CO2e
MTS	Metropolitan Transit System
MWD	Water District
MWh	megawatt hours
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAHC	Native American Heritage Commission
NAS	Naval Air Station
NATA	National Air Toxics Assessment
NAVWAR	Naval Information Warfare Systems Command

Acronym	Definition
Navy	U.S. Department of the Navy
NBC	Naval Base Coronado
NCCP	Natural Community Conservation Planning
NCTD	North County Transit District
NCWRP	North City Water Reclamation Plant
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NEV	Neighborhood Electric Vehicle
NFIP	National Flood Insurance Program
NHD	National Hydrography Dataset
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NNL	National Natural Landmarks
NO	nitric oxide
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOAA	National Oceanographic and Atmospheric Administration
NOC	Notice of Completion
NOLF	Naval Outlying Landing Field
NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPDWR	National Primary Drinking Water Regulations
NPPA	Native Plant Protection Act
NRHP	National Register of Historic Places
NSDWR	National Secondary Drinking Water Regulations
NSF	National Science Foundation
NWI	National Wetlands Inventory
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OHP	Office of Historic Preservation
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
OTC	Old Town Campus
OWTS	Onsite Wastewater Treatment Systems
PAMA	Pre-Approved Mitigation Area
Pb	lead
PCBs	polychlorinated biphenyls

Acronym	Definition
PDPs	Priority Development Projects
PEV	Plug-In Electric Vehicle
PIP	Public Involvement Plan
PIR	Pacific Imperial Railroad, Inc.
PM	particulate matter
PM_{10}	PM smaller than or equal to 10 microns in diameter
$PM_{2.5}$	PM smaller than or equal than 2.5 microns in diameter
PMPU	Port Master Plan Update
POE	Port of Entry
POM	polycyclic organic matter
Port	Unified Port District of San Diego
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
ppb	parts per billion
ppm	parts per million
PPV	Peak Particle Velocity
PRC	Public Resources Code
PRPA	Paleontological Resources Preservation Act
psi	pounds per square inch
PUC	Public Utilities Code
Pure Water Program	Pure Water San Diego Program
Rapid	Bus Rapid Transit
RAQS	Regional Air Quality Strategy
RAS	Regional Arterial System
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
ReCAP	Climate Action Planning Framework
REL	recommended exposure limit
RES	Regional Energy Strategy
REVI	Regional Electric Vehicle Infrastructure Working Group
RHA	Rivers and Harbors Act of 1899
RHNA	Regional Housing Needs Assessment
RMP	Risk Management Plan
RMP	Resource Management Plan
rms	root-mean-square
ROW	right-of-way
ROWD	Report of Waste Discharge
RPO	Resource Protection Ordinance
RPS	Renewables Portfolio Standard
RTIP	Regional Transportation Improvement Program

Acronym	Definition
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SAA	State Aeronautics Act
SAA	Streambed Alteration Agreement
SAFE	Safer Affordable Fuel-Efficient
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SAM	Site and Mitigation
SANDAG	San Diego Association of Governments
SB	Senate Bill
SBIWTP	South Bay International Wastewater Treatment Plant
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCIC	South Coastal Information Center
Scoping Plan	Climate Change Scoping Plan
SCS	Sustainable Communities Strategy
SD&AE	San Diego and Arizona Eastern Railway Company
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SDCRAA	San Diego County Regional Airport Authority
SDCSD	San Diego County Sheriff's Department
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas and Electric
SDIA	San Diego International Airport
SDIV	San Diego and Imperial Valley Railroad
SDMMP	San Diego Management and Monitoring Program
SDSU	San Diego State University
SF6	sulfur hexafluoride
SFAP	Sustainable Freight Action Plan
SFHAs	Special Flood Hazard Areas
SFP	School Facilities Program
SGMA	Sustainable Groundwater Management Act
SHMA	Seismic Hazards Mapping Act
SHPO	State Historic Preservation Officer
SHSP	Strategic Highway Safety Plan
SIL	Significant Impact Levels
SIP	State Implementation Plan
SIS	Smart Intersection Systems
SIS	Smart Intersection Systems

Acronym	Definition
SLCP	Short-Lived Climate Pollutant
SLF	Sacred Lands File
SLIC	Spills-Leaks-Investigations-Cleanups
SLT	screening-level threshold
SMARA	State Surface Mining and Reclamation Act of 1975
SMGB	State Mining and Geology Board
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SPL	sound pressure level
SQGs	small-quantity generators
SR 125	State Route 125
SR 56	State Route 56
SR 94	State Route 94
SRA	State Responsibility Areas
SSMP	Sewer System Management Plan
SSOs	sanitary sewer overflows
SUSMP	Standard Urban Stormwater Mitigation Plan
SVP	Society of Vertebrate Paleontology
SWIS	Solid Waste Inventory System
SWMP	Stormwater Management Plan
SWP	State Water Project
SWPPP	Storm Water Prevention Pollution Plan
SWRCB	State Water Resource Control Board
SYMH	San Ysidro Mobility Hub
TAC	toxic air contaminant
TCMs	traffic control measures
TCRs	tribal cultural resources
TDM	Transportation Demand Management
TDS	total dissolved solids
THI	total health hazard index
TIA	Tijuana International Airport
TMDL	Total Maximum Daily Load
TPAs	Transit Priority Areas
TPZ	Timberland Production Zone
Transfer Agreement	Water Authority–IID Water Conservation and Transfer Agreement
TRUs	Transportation Refrigeration Units
TSM	Transportation System Management
TSMO	Transportation System Management and Operations
UCSD	University of California San Diego

Acronym	Definition
UDC	Unified Disaster Council
UFP	ultrafine particulate matter
Unified Program	Unified Hazardous Waste and Hazardous Materials Program
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey's
UST	underground storage tank
UWMP	Urban Water Management Plan
UXO	unexploded ordinance
VAP	Voluntary Assistance Program
VdB	vibration decibels
VHFHSZs	Very High Fire Hazard Severity Zones
VMT	vehicle miles traveled
VMT	vehicles miles traveled
VOC	volatile organic compounds
VPHCP	Vernal Pool Habitat Conservation Plan
VSQGs	very small-quantity generators
WDR	Waste Discharge Requirements
WQOs	water quality objectives
WRP	Water Reclamation Plant
WSA	Water Supply Assessment
WSCP	Water Shortage and Drought Response Plan
WTP	Water Treatment Plant
WUI	Wildland Urban Interface
WWTP	wastewater treatment plant
ZEV	zero-emission vehicle

EXECUTIVE SUMMARY

This is the San Diego Association of Governments' (SANDAG's) ~~Draft~~ Final Environmental Impact Report (EIR) for San Diego Forward: The 2021 Regional Plan ("the proposed Plan"). It has been prepared in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Section 21000 et seq.) and the Guidelines for Implementation of CEQA (CEQA Guidelines) (14 California Code of Regulations Sections 15000 et seq.). The proposed Plan is an update to San Diego Forward: The 2015 Regional Plan ("the 2015 Regional Plan"), adopted in October 2015, and the 2019 Federal Regional Transportation Plan ("the 2019 Federal RTP"), adopted in October 2019. The proposed Plan updates the Regional Comprehensive Plan (RCP) for the San Diego region and the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

This ~~Draft~~ EIR analyzes the significant environmental impacts of the proposed Plan, mitigation measures to avoid or reduce these impacts, and alternatives to the proposed Plan. It was prepared to disclose this information to decision makers, members of the public, and public agencies so that informed decisions can be made about the proposed Plan. CEQA requires that decision makers make informed decisions on a project, considering the information presented in the EIR, along with social, economic, and other factors.

The~~is~~ Draft EIR ~~is~~was available for a 45-day public review period, from August 27, 2021 to October 11, 2021. Following the public review period, SANDAG ~~will~~ prepared written responses to significant environmental concerns raised in the comments on the Draft EIR. The Final EIR ~~will~~ includes revisions to the Draft EIR, comments received on the Draft EIR either verbatim or in summary, and SANDAG's responses to significant environmental concerns raised in the public comments (Appendix P).

ES.1 SUMMARY OF THE PROPOSED PLAN

The proposed Plan includes a blueprint for a regional transportation system, serving existing and projected residents and workers within the San Diego region (Figure 2-1) that further enhances quality of life and offers more mobility options for people and goods. The proposed Plan looks ahead to 2050, and accommodates for more than 430,000 new residents, approximately 440,000 new jobs, and over 280,000 new housing units.

The underlying purpose of the proposed Plan, in summary, is to develop a Regional Plan that addresses the many regional transportation challenges that are deeply connected to larger societal issues that impact everyone's quality of life, including economic and social inequities, climate change, public health, and safety. Consistent with this underlying purpose, SANDAG developed the following project objectives for this EIR:

1. Focus population and employment growth in mobility hubs and existing urban areas to protect sensitive habitat and natural resource areas.
2. Provide transportation investments that support compact land development patterns and reduce sprawl.
3. Meet greenhouse gas emissions targets established for the San Diego region by the California Air Resources Board and the SANDAG Board of Directors.
4. Provide transportation investments and land use patterns that promote social equity.
5. Provide transportation investments and land use patterns that reduce vehicle miles traveled and improve air quality.
6. Provide multi-modal access to employment centers and key destinations for all communities.

7. Enhance the efficiency of the transportation network for moving people and goods through the deployment of new technologies.

Under Senate Bill (SB) 375, the regional transportation plan must include an SCS consisting of land use, housing, and transportation strategies that, if implemented, would allow the region to meet its regional targets for greenhouse gas (GHG) emissions reductions from passenger vehicle use established by the California Air Resources Board (CARB). The purpose of an SCS is to align regional transportation, housing, and land use planning to attain the regional GHG reduction target. Although SB 375 sets GHG reduction targets for only the years 2020 and 2035, the proposed Plan also includes a longer 2050 time horizon. This was done because a major local transportation funding program (the *TransNet* Extension Ordinance and Expenditure Plan) extends to almost 2050.

The SCS land use pattern concentrates future development in areas that support connection to high-frequency transit services called *Mobility Hubs.* The proposed Plan incentivizes land uses and transportation infrastructure in Mobility Hub areas that maximize the connectivity of the transportation system. Mobility Hubs are proposed for communities with a high concentration of people, destinations, and travel choices where densification is envisioned in the SCS. Mobility Hubs are unique to each community and reflect respective community transportation needs, and would be developed in accordance with the land use authority reserved to local jurisdictions.

The proposed Plan includes the SCS as well as the "5 Big Moves," transportation network improvements, and supporting policies and programs. The 5 Big Moves consist of Complete Corridors, Transit Leap, Mobility Hubs, Flexible Fleets, and Next Operating System (Next OS), and each of these elements is discussed in greater detail in Section 2.5.1, *The 5 Big Moves*, of this EIR.

The proposed Plan creates an integrated transportation system throughout the 11 Major Travel Corridors of the San Diego region, specifically: South Bay to Sorrento; Central Mobility Hub; State Route 125 (SR 125); Interstate 15 (I-15); Interstate 5 (I-5) North Coast Corridor; State Route 94 (SR 94); Interstate 8 (I-8); Coast, Canyons, and Trails; State Route 56 (SR 56); San Vicente; and North County. The system components in each Major Travel Corridor consist of transportation improvements under each of the 5 Big Moves, enhanced Airport Connectivity, and improved Border/Ports of Entry. The proposed Plan consists of 11 policies and programs that support the implementation of the transportation network and SCS.

ES.2 PROJECT LOCATION

The project boundary of the proposed Plan includes the entire San Diego region, which is composed of more than 4,200 square miles (see Figure 2-1). To the north, the region is bordered by Orange and Riverside counties, although largely separated from Orange County by Marine Corps Base Camp Pendleton. To the south of the region is the U.S. border with Mexico. The Pacific Ocean forms a natural border to the west, and the region shares a border with Imperial County to the east. The majority of urban development lies in the western portion of the San Diego region along the coast. The communities located inland in the eastern portion of the region have focused on maintaining a rural character. Over half of the total land area in the region is not available for public development, including public lands, dedicated parks and open space, lands constrained for environmental reasons, and military use. The San Diego region is supported by an existing network of freeways, expressways, regional arterials, transit corridors, regional bus and rail transit corridors, bikeways, commercial and general aviation facilities, seaport facilities, and ports of entry at the U.S–Mexico border. The project location and environmental setting are discussed in more detail in Chapter 3, *Environmental Setting*.

ES.3 AREAS OF CONTROVERSY

CEQA Guidelines Section 15123(b)(2) requires that an EIR contain a discussion of areas of controversy known to the lead agency, including issues raised by agencies and the public. Several areas of controversy were identified during the EIR scoping process, and through public input on the proposed Plan outside of the Notice of Preparation (NOP) process.

These areas of concern were brought forth through letters and presented at SANDAG board meetings. In no particular order, areas of controversy known to SANDAG include:

- Providing an increase in *Rapid* transit, the Purple Line as a Trolley, and other rail corridor service enhancements.
- Determining a long-term sustainable solution for continue rail service through the Del Mar Bluffs area.
- Importance of meeting and exceeding SB 375 and other State greenhouse gas reduction targets.
- How to provide an efficient and equitable transportation system.
- How to address the need for affordable housing in the region; make infrastructure investments in areas with future housing growth.
- Whether to provide transit fare subsidies for Youth Opportunity Passes, senior citizens, and disadvantaged community members.
- How to address the regional divide in digital access.
- Whether to reduce expanding freeways and focus land use and transportation growth within urban core areas that would provide affordable housing and transportation needs and meet GHG and vehicle miles traveled (VMT) reduction targets.
- How to reduce transportation-related pollution levels in disadvantaged communities.
- How to accommodate future growth and housing while decreasing sprawl into natural open space areas.
- Providing safe opportunities for biking and walking that encourage increased physical activity.

ES.4 ISSUES TO BE RESOLVED

CEQA Guidelines Section 15123(b)(3) requires that an EIR contain a discussion of issues to be resolved. Issues to be resolved in this EIR include choosing among alternatives to the proposed Plan, and deciding how to mitigate the proposed Plan's significant environmental impacts. Additionally, if it adopts the proposed Plan, the SANDAG Board of Directors must decide whether specific social, economic, or other benefits of the proposed Plan outweigh its significant unavoidable environmental impacts; if so, the Board of Directors must adopt a Statement of Overriding Considerations.

ES.5 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Table ES-1 provides a summary of environmental impacts, mitigation measures to avoid or reduce significant impacts, and significance of the impact after mitigation is applied, for 2020, 2035, and 2050. This summary is based on the impact analyses provided in Chapter 4, Sections 4.1 through 4.19. A detailed analysis of cumulative impacts is provided in Chapter 5, which identifies probable future projects, as well as regional planning documents and other growth projections, and analyzes the cumulative environmental impacts for each environmental resource area when combined with the proposed Plan.

Table ES-1
Summary of Environmental Impacts and Mitigation Measures

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
4.1 Aesthetics and Visual Resources				
AES-1 Have a substantial adverse effect on a scenic vista Significant impact in 2025, 2035, and 2050	**AES-1a Protect Public Views of Scenic Vistas for Transportation Network Improvements** **AES-1b Protect Public Views of Scenic Vistas for Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
AES-2 Substantially damage scenic resources, including, but not limited to, trees, rocks, outcroppings, and historic structures within a state scenic highway Significant impact in 2025, 2035, and 2050	**AES-1a Protect Public Views of Scenic Vistas for Transportation Network Improvements** **AES-2a Reduce Impacts on Scenic Resources within a State Scenic Highway and Local Scenic Resources for Transportation Network Improvements** **AES-2b Reduce Impacts on Scenic Resources within a State Scenic Highway and Local Scenic Resources for Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
AES-3 Substantially degrade the existing visual character or quality of public views of the site and its surroundings, including adding a visual element of urban character to an existing rural or open space area, conflicting with regulations governing scenic quality Significant impact in 2025, 2035, and 2050	**AES-1a Protect Public Views of Scenic Vistas for Transportation Network Improvements** **AES-2a Reduce Impacts on Scenic Resources within a State Scenic Highway and Local Scenic Resources for Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	AES-2b Reduce Impacts on Scenic Resources within a State Scenic Highway and Local Scenic Resources for Development Projects **AES-3a Reduce Impacts on Visual Character for Transportation Network Improvements** **AES-3b Reduce Impacts on Visual Character for Development Projects**			
AES-4 Substantially degrade the existing visual character or quality of public views of the site and its surroundings by creating a new source of substantial light or glare that would adversely affect day or nighttime views Significant impact in 2025, 2035, and 2050	**AES-4a Minimize Effects of Light and Glare for Transportation Network Improvements** **AES-4b Minimize Effects of Light and Glare for Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.2 Agricultural and Forestry Resources				
AG-1 Convert agricultural lands to nonagricultural use Significant impact in 2025, 2035, and 2050	**AG-1a Preserve Existing Agricultural Lands** **AG-1b Reduce Transportation Network Improvement and Development Conflicts with Agricultural Operations**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
AG-2 Conflict with existing zoning for agricultural use, or a Williamson Act contract Significant impact in 2025, 2035, and 2050	**AG-1a Preserve Existing Agricultural Lands** **AG-1b Reduce Transportation Network Improvement and Development Conflicts with Agricultural Operations**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
FR-1 Convert or result in the loss of "Forest Land" as defined in the California Forest Legacy Act of 2007 (Public Resources Code Section 12220(g)) Significant impact in 2025, 2035, and 2050	**FR-1 Reduce Impacts on Forest Lands** **BIO-1a Implement Design, Minimization, and Avoidance Measures for Sensitive Natural Communities and Regulated Aquatic Resources** **BIO-1b Provide Compensatory Mitigation** **BIO-1e Implement Best Management Practices to Avoid Indirect Impacts**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.3 Air Quality				
AQ-1 Conflict with or obstruct implementation of the Regional Air Quality Strategy and/or State Implementation Plan Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
AQ-2 Result in a cumulatively considerable net increase in nonattainment criteria pollutants, including VOC, NO_X, PM10, PM2.5, and SO_X Significant impact in 2050. Less-than-significant impact in 2025 and 2035.	**AQ-2a Secure Incentive Funding** **AQ-2b Zero Emission Trains** **GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans** **GHG-5b Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure**	Not applicable	Not applicable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	GHG-5d Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide **GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects** **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects**			
AQ-3 Result in construction-related emissions above regional mass emission thresholds Significant impact in 2025, 2035, and 2050	**AQ-3a Implement Construction Best Management Practices for Fugitive Dust** **AQ-3b Reduce Diesel Emissions During Construction from Off-Road Equipment** **AQ-3c Reduce Diesel Emissions from On-Road Vehicles** **GHG-5e Implement Measures to Reduce GHG Emissions from Transportation Projects** **GHG-5f Implement Measures to Reduce GHG Emissions from Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
AQ-4 Expose sensitive receptors to substantial PM10 and PM2.5 concentrations Significant impact in 2025, 2035, and 2050	**AQ-2a Secure Incentive Funding** **AQ-4 Reduce Exposure to Localized Particulate and/or TAC Emissions** **GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	GHG-5b Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure **GHG-5d Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide** **GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects** **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects**			
AQ-5 Expose sensitive receptors to substantial TAC concentrations Significant impact in 2025, 2035, and 2050	**AQ-2a Secure Incentive Funding** **AQ-4 Reduce Exposure to Localized Particulate and/or TAC Emissions** **AQ-5a Reduce Exposure to Localized Toxic Air Contaminant Emissions** **AQ-5b. Reduce Exposure to Localized Toxic Air Contaminant Emissions during Railway Design** **GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans** **GHG-5b Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure** **GHG-5d Develop and Implement Regional Digital Equity Strategy and**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	Action Plan to Advance Smart Cities and Close the Digital Divide **GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects** **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects**			
AQ-6 Expose sensitive receptors to carbon monoxide hot-spots Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
AQ-7 Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
4.4 Biological Resources				
BIO-1 Have a substantial adverse effect on any sensitive natural communities identified in local or regional plans, policies, regulations, or by CDFW or USFWS; or have a substantial adverse effect on state or federally regulated waters and wetlands through direct removal, filling, hydrological interruption, or other means Significant impact in 2025, 2035, and 2050	**BIO-1a Implement Design, Minimization, and Avoidance Measures for Sensitive Natural Vegetation Communities and Regulated Aquatic Resources** **BIO-1b Provide Compensatory Mitigation** **BIO-1c Prepare a Habitat Restoration Plan** **BIO-1d Prepare Habitat/Long-Term Management Plans**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	Bio-1e Implement Best Management Practices to Avoid Indirect Impacts			
BIO-2 Have a substantial adverse effect, either directly or indirectly, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or listed by CDFW or USFWS, including their federally designated critical habitat, or species that are considered sensitive in CEQA Guidelines Section 15380 Significant impact in 2025, 2035, and 2050	**BIO-2a Implement Design, Minimization, and Avoidance Measures for Special-Status Animal Species** **BIO-2b Provide Compensatory Mitigation for Special-Status Plant Species** **BIO-2c Provide Compensatory Mitigation for Special-Status Animal Species** **BIO-1a Implement Design, Minimization, and Avoidance Measures for Sensitive Natural Vegetation Communities and Regulated Aquatic Resources** **BIO-1b Provide Compensatory Mitigation** **BIO-1c Prepare a Habitat Restoration Plan** **BIO-1d Prepare Habitat / Long-Term Management Plans**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
BIO-3 Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites Significant impact in 2025, 2035, and 2050	**BIO-3 Facilitate Wildlife Movement**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
BIO-4 Conflict with the provisions of an adopted HCP, NCCP, or other conservation plan, or with any local policies or ordinances protecting biological resources Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
4.5 Cultural Resources				
CULT-1 Cause a substantial adverse change in the significance of a historical resource or unique archaeological resource Significant impact in 2025, 2035, and 2050	**CULT-1a Develop Project-Level Measures for Development Projects and Transportation Network Improvements** **CULT-1b Implement Monitoring and Data Recovery Programs for Development Projects and Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
CULT-2 Disturb any human remains, including those interred outside of dedicated cemeteries, in violation of existing laws and regulations protecting human remains Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
4.6 Energy				
EN-1 Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy during project construction or operations	Not applicable	Not applicable	Not applicable	Not applicable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
Less-than-significant impact in 2025, 2035, and 2050				
EN-2 Conflict with or obstruct a state or local plan for renewable energy or energy efficiency Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
4.7 Geology, Soils, and Paleontological Resources				
GEO-1 Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: • **Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area, or based on other substantial evidence showing an earthquake fault is active;** • **Strong seismic ground shaking;** • **Seismic-related ground failure, including liquefaction; and** • **Landslides** Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
GEO-2 Locate projects on a geologic unit or soil that is expansive or unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse, creating substantial direct or indirect risks to life or property	Not applicable	Not applicable	Not applicable	Not applicable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
Less-than-significant impact in 2025, 2035, and 2050				
GEO-3 Result in substantial soil erosion or the loss of topsoil Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
GEO-4 Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater, potentially causing adverse groundwater impacts Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
PALEO-1 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature Significant impact in 2025, 2035, and 2050	**PALEO-1a Identify the Potential for Unique Paleontological Resources or Unique Geologic Features for Development Projects or Transportation Network Improvements** **PALEO-1b Avoid or Reduce Impacts on Unique Paleontological Resources or Unique Geologic Features for Development Projects or Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.8 Greenhouse Gas Emissions				
GHG-1 Directly or indirectly result in an increase in GHG emissions compared to existing conditions (2016)	Not applicable	Not applicable	Not applicable	Not applicable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
Less-than-significant impact in 2025, 2035, and 2050				
GHG-2 Conflict with the SANDAG region's achievement of SB 375 GHG emissions reduction targets for 2035 Less-than-significant impact in 2035	Not applicable	Not applicable	Not applicable	Not applicable
GHG-3 Conflict with or impede achievement of an at least 30% reduction in per capita GHG emissions from the entire on-road transportation sector by 2035 compared to existing conditions (2016) Less-than-significant impact in 2035	Not applicable	Not applicable	Not applicable	Not applicable
GHG-4 Conflict with or impede the implementation of local plans adopted for the purpose of reducing GHG emissions Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
GHG-5 Be inconsistent with the State's ability to achieve the 2030 reduction target of SB 32 and long-term reduction goals of Executive Orders S-3-05 and B-55-18. Significant impact in 2030, 2045, and 2050	**GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans** **GHG-5b Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure** **GHG-5c Implement Nature-Based Climate Solutions to Remove Carbon Dioxide from the Atmosphere** **GHG-5d Develop and Implement Regional Digital Equity Strategy and**	Significant and Unavoidable (in 2030)	Significant and Unavoidable (in 2045)	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	Action Plan to Advance Smart Cities and Close the Digital Divide **GHG-5e Implement Measures to Reduce GHG Emissions from Transportation Projects** **GHG-5f Implement Measures to Reduce GHG Emissions from Development Projects** **AQ-3b Reduce Diesel Emissions During Construction from Off-Road Equipment** **AQ-3c Reduce Diesel Emissions from On-Road Vehicles** **AQ-4 Reduce Exposure to Localized Particulate and/or TAC Emissions** **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects** **WS-1a Implement Water Conservation Measures for Transportation Network Improvements** **WS-1b Implement Water Conservation Measures for Development Projects**			
4.9 Hazards and Hazardous Materials				
HAZ-1 Create a significant hazard by generating hazardous emissions or handling hazardous materials, or result in the release of hazardous materials into the environment during pre-construction, demolition, and/or construction activities, including being located on a Government	Not applicable	Not applicable	Not applicable	Not applicable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
Code Section 65952.5 hazardous materials site Less-than-significant impact in 2025, 2035, and 2050				
HAZ-2 Create a significant hazard to the public, schools within one-quarter mile, or the environment through the routine use, handling, transport, or disposal of hazardous materials Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
HAZ-3 For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
HAZ-4 Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan or result in inadequate emergency access Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
4.10 Hydrology and Water Quality				
HWQ-1 Substantially degrade surface water or groundwater quality, including in violation of any water quality standards or	Not applicable	Not applicable	Not applicable	Not applicable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
waste discharge requirements or in conflict with a water quality control plan or its implementation Less-than-significant impact in 2025, 2035, and 2050				
HWQ-2 Substantially alter the existing drainage pattern of an area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
HWQ-3 Substantially alter the existing drainage pattern of an area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would (i) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site or (ii) impede or redirect flood flows Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
HWQ-4 Substantially increase risk of pollutant release due to inundation of a flood hazard, tsunami, or seiche zone Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
4.11 Land Use				
LU-1 Physically divide an established community Significant impact in 2025, 2035, and 2050	**LU-1 Provide Access and Connections for Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
LU-2 Cause a significant environmental impact due to a conflict with any land use plan, policy or regulation (including, but not limited to, the general plan, local coastal program, or zoning ordinance) and result in a physical change to the environment not already addressed in the other resource chapters of this EIR Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
4.12 Mineral Resources				
MR-1 Result in the loss of availability of known aggregate and mineral resources supply sites that would be of value to the region and the residents of the state, or result in the loss of availability of a locally-important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan Significant impact in 2025, 2035, and 2050	**MR-1a Conserve Aggregate and Mineral Resources During Planning and Design of Development Projects** **MR-1b Conserve Aggregate and Mineral Resources During Planning and Design of Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.13 Noise and Vibration				
NOI-1 Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable	**NOI-1a Implement Construction Noise Reduction Measures for Development Projects and Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
standards of other agencies; or generate a substantial absolute increase in ambient noise Significant impact in 2025, 2035, and 2050	**NOI-1b Implement Operational Noise Reduction Measures for Transportation Network Improvements** **NOI-1c Implement Operational Noise Reduction Measures for Development Projects**			
NOI-2 Generation of excessive groundborne vibration or groundborne noise levels Significant impact in 2025, 2035, and 2050	**NOI-2a Implement Construction Groundborne Vibration and Noise Reduction Measures** **NOI-2b Implement Groundborne Vibration and Noise-Reducing Measures for Rail Operations**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
NOI-3 For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would expose people residing or working in the project area to excessive noise levels Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
4.14 Population and Housing				
POP-1 Induce substantial unplanned population growth to areas of the region either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., by extending roads and other infrastructure) Significant impact in 2025, 2035, and 2050	No feasible mitigation	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
POP-2 Displace substantial numbers of people or housing units, which would necessitate the construction of replacement housing elsewhere Significant impact in 2025, 2035, and 2050	**POP-2a Design Development Projects to Reduce Displacement** **POP-2b Design Transportation Network Improvement Projects to Reduce Displacement**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.15 Public Services and Utilities				
PS-1 Result in substantial adverse physical impacts associated with the provision of or need for new or physically altered (i.e., expanded) public facilities, in order to maintain adequate fire and police protection, emergency services, schools, libraries, and recreation facilities Significant impact in 2025, 2035, and 2050	**PS-1 Implement Mitigation Measures for New/Expanded Public Service Facilities**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
REC-1 Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated Significant impact in 2025, 2035, and 2050	**REC-1 Implement Mitigation Measures for Parks and other Recreational Facilities**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
U-1 Result in the expansion, relocation, or construction of wastewater collection and treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities to adequately meet projected capacity needs, the construction of which could cause significant environmental impacts Significant impact in 2025, 2035, and 2050	**U-1a Implement Mitigation Measures for New/Expanded Wastewater, Stormwater, Electrical, Natural Gas, and Telecommunications Facilities Associated with Development Projects** **U-1b Implement Mitigation Measures for New/Expanded Stormwater Facilities Associated with Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
U-2 Generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure; negatively impact the provision of solid waste services or impair the attainment of solid waste reduction goals; or fail to comply with federal, state, and local management and reduction statutes and regulations related to solid waste Significant impact in 2035 and 2050. Less-than significant-impact in 2025.	**U-2a Implement Mitigation Measures for New/Expanded Solid Waste Facilities** **U-2b Reduce Construction Waste** **U-2c Reduce Operational Waste**	Not applicable	Significant and Unavoidable	Significant and Unavoidable
4.16 Transportation				
TRA-1 Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
TRA-2 Conflict or be inconsistent with CEQA Guidelines Section 15064.3 by not achieving the substantial VMT reductions needed to help achieve statewide GHG reduction goals Significant impact in 2025, 2035, and 2050	**TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects** **GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans** **GHG-5d Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	GHG-5f Implement Measures to Reduce GHG Emissions from Development Projects			
TRA-3 Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
TRA-4 Lead to a lack of parking supply that would cause significant secondary environmental impacts not already analyzed in other resource chapters of this EIR Less-than-significant impact in 2025, 2035, and 2050	Not applicable	Not applicable	Not applicable	Not applicable
4.17 Tribal Cultural Resources				
TCR-1 Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 that is either (1) listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or (2) determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1	**TCR-1a Implement Tribal Cultural Resources Mitigation Measures for Development Projects and Transportation Network Improvements** **TCR-1b Implement Monitoring and Mitigation Programs for Development Projects and Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
Significant impact in 2025, 2035, and 2050				
4.18 Water Supply				
WS-1 Not have sufficient water supplies available to serve the projected regional demand during normal, dry and multiple dry years Significant impact in 2050. Less-than-significant impact in 2025 and 2035	**WS-1a Implement Water Conservation Measures for Transportation Network Improvements** **WS-1b Implement Water Conservation Measures for Development Projects** **WS-1c Ensure Adequate Water Supply for Development Projects**	Not applicable	Not applicable	Significant and Unavoidable
WS-2 Substantially decrease groundwater supplies, or interfere substantially with groundwater recharge such that the proposed Plan would impede sustainable management of groundwater basins or obstruct implementation of a sustainable groundwater management plan Significant impact in 2025, 2035, and 2050	**WS-1a Implement Water Conservation Measures for Transportation Network Improvements** **WS-1b Implement Water Conservation Measures for Development Projects** **WS-2 Implement Groundwater Measures to Ensure Sustainable Yield for Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
WS-3 Require or result in the relocation or construction of new or expanded water facilities, the construction or relocation of which could cause significant environmental effects Significant impact in 2025, 2035, and 2050	**WS-1a Implement Water Conservation Measures for Transportation Network Improvements** **WS-1b Implement Water Conservation Measures for Development Projects** **WS-1c Ensure Adequate Water Supply for Development Projects** **WS-2 Implement Groundwater Measures to Ensure Sustainable Yield for Development Projects** **WS-3 Implement Measures for New or Expanded Water Facilities**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
4.19 Wildfire				
WF-1 Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire; or expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires Significant impact in 2025, 2035, and 2050	**WF-1 Reduce Wildfire Risk for Development and Transportation Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
WF-2 Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment Significant impact in 2025, 2035, and 2050	**WF-2 Reduce Wildfire Risk Related to Wildfire-Associated Infrastructure Required to Support Development or Transportation Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
WF-3 Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes Significant impact in 2025, 2035, and 2050	**WF-3 Reduce Post-Fire Risks Related to Flooding, Landslides, Slope Instability, or Drainage Changes for Development and Transportation Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

ES.6 ALTERNATIVES TO THE PROPOSED PLAN

Chapter 6 in this EIR analyzes three alternatives to the proposed Plan in detail. The analysis determines the extent to which alternatives are capable of avoiding or substantially lessening the significant environmental effects of the proposed Plan. Chapter 6 also explains why other alternatives were considered but rejected from detailed consideration. The three alternatives analyzed in detail are listed below and summarized in Table ES-2:

- **Alternative 1**: No Project Alternative
- **Alternative 2**: 2019 Transportation Network with New Value Pricing and User Fee Policies
- **Alternative 3**: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies

The alternatives respond to public suggestions for alternatives that reduce vehicle miles traveled, air pollutants, and GHG emissions, while decreasing sprawl and the consumption of native habitat areas. The alternatives were developed based on public input from the NOP scoping period and during the development of the proposed Plan.

Alternative 3 is considered the environmentally superior alternative. As discussed in Chapter 6, although Alternative 3 would not reduce any of the proposed Plan's significant impacts to less-than-significant levels, it would reduce many of the proposed Plan's significant impacts. Compared to the proposed Plan's significant impacts, Alternative 3 would have decreased impacts for one or more significance criteria for the following environmental resources: aesthetics and visual resources, agricultural and forestry resources, air quality, biological resources, cultural resources, energy, paleontological resources, greenhouse gas emissions, mineral resources, noise and vibration, public services, transportation, tribal cultural resources, water supply, and wildfire. Compared to the proposed Plan's significant impacts, Alternative 3 would have increased impacts for only a few significance criteria: for land use, and population and housing.

Alternative 3 would result in a ~~-23~~23.1 percent per capita GHG reduction in 2050, which would result in a greater reduction than the proposed Plan (-~~20.7~~21.0 percent below 2005). In addition, Alternative 3 would result in VMT per capita of ~~16.3~~15.6 (~~for all vehicle classes~~home-based) compared to the proposed Plan VMT per capita of ~~16.8~~16.03 in 2050 (see Table O-2 in Appendix O). Alternative 3 would result in a total VMT increase of ~~3,479,273~~2,756,715 miles per day in year 2050, which is approximately ~~38~~39 percent lower than the proposed Plan (total VMT increase of ~~5,611,752~~4,519,230 miles per day in year 2050). Alternative 3 would also result in a decrease in ROG, NO_X (with the exception of a 0.01 tons per day increase in 2025), CO, PM2.5, PM10, and SO_X emissions compared to the proposed Plan from on-road sources. Among the alternatives, Alternative 3 would achieve the greatest reductions for VMT, GHG emissions, and air quality emissions compared to the proposed Plan.

Table ES-2
Summary of Alternatives Considered in Detail

Components		Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
Land Use Pattern		2019 Federal RTP Land Use Pattern	2019 Federal RTP land use pattern	Similar to Proposed Plan except land use pattern with new growth focused in proposed mobility hubs
Transportation Network		"No Build" Projects	2019 Federal RTP transportation network	Proposed Plan transportation network
New Value Pricing and User Fees Policies	*Toll Pricing*	Existing Policy	Same as proposed Plan (By 2035, update toll pricing to $0.30 per mile on I-15 and other Managed Lane facilities)	Same as proposed Plan (By 2035, update toll pricing to $0.30 per mile on I-15 and other Managed Lane facilities)
	Road User Charge	None	None	By 2026, increase road user charge rate to ~~3~~4.95 cents/mile, compared to ~~2~~3.3 cents/mile by 2030 in the proposed Final Plan~~.~~
	Parking Costs	Existing Policy	2019 Federal RTP	Increases in parking costs by 50% compared to the proposed Plan.
	Transit Costs	Existing Policy	2019 Federal RTP (No planned transit fare discounts.)	Free transit by 2035.
	Microtransit Costs	N/A	N/A	Free Microtransit by 2035, compared to $1.25 one way/$3 day in the proposed Plan
	Micro-Transponder ownership	N/A	Same as proposed Plan (Microtransponder[2] ownership of 100 percent by 2035)	Same as proposed Plan (Microtransponder ownership of 100 percent by 2035)
	Telework Assumptions	N/A	Same as proposed Plan	Same as proposed Plan

Components		Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	Micromobility	N/A	Same as proposed Plan (Increases in micro-mobility through assumed personal owned e-bike growth)	Same as proposed Plan (Increases in micro-mobility through assumed personal owned e-bike growth)
Funding		Committed funding	2019 Federal RTP ($130 billion)	Same as Proposed Plan ($163 billion)

[1] These consist of transportation projects with environmental clearance, that have full funding, are under construction, or are otherwise reasonably foreseeable based on current plans.
[2] A microtransponder is an electronic toll collection device that allows users to pay tolls automatically from inside their vehicle.

1 INTRODUCTION

This Program Environmental Impact Report (EIR) has been prepared by the San Diego Association of Governments (SANDAG) in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Section 21000 et seq.), and the CEQA Guidelines(14 California Code of Regulations, Sections 15000 et seq.). This EIR evaluates environmental impacts that would occur if San Diego Forward: The Regional Plan ("the proposed Plan") was adopted and implemented.

The proposed Plan is an update of the 2015 Regional Plan/Sustainable Communities Strategy for the San Diego Region and the 2019 Federal Regional Transportation Plan.

SANDAG is a regional planning agency and Metropolitan Planning Organization (MPO) composed of 18 cities and the county government within the San Diego region. SANDAG must prepare a Regional Transportation Plan (RTP) every 4 years (Government Code Section 65080 et seq.; 23 United States CodeSection 134). The RTP must include a Sustainable Communities Strategy (SCS) consisting of land use, housing, and transportation strategies that, if implemented, would allow the region to meet its regional targets for greenhouse gas emissions reductions from passenger vehicle use established by the California Air Resources Board (Sustainable Communities and Climate Protection Act of 2008, Senate Bill 375, Chapter 728, Statutes of 2008).

The proposed Plan, described in detail in Chapter 2, *Project Description*, of this EIR, integrates land use, transportation systems, infrastructure needs, and public investment strategies within a regional framework intended to preserve and improve quality of life, maximize mobility and transportation choices, and conserve and protect natural resources. It meets the requirements of federal and State transportation planning law, and also meets the requirements for the Regional Comprehensive Plan for the San Diego Region established by State law (Assembly Bill 361, Chapter 508, Statutes of 2003).

1.1 PURPOSE OF THIS EIR

The purpose of an EIR, is "to identify the significant effects on the environment of a project, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided" (PRC Section 21002.1[a]). This EIR analyzes the significant environmental effects of the proposed Plan, identifies feasible mitigation measures to avoid or reduce these impacts, and presents alternatives to the proposed Plan that could avoid or reduce significant impacts. This EIR was prepared to disclose this information to decision makers, members of the public, and public agencies, so that decision makers can make informed decisions about the proposed Plan.

This EIR does not recommend to decision makers whether the proposed Plan should be approved. CEQA requires that decision makers make informed decisions on a project, considering the information presented in the EIR. CEQA allows for the proposed Plan to be approved even if there are significant and unavoidable environmental impacts. This can occur if decision makers find that social, economic, or other benefits outweigh the unavoidable significant impacts. In such a case, a "statement of overriding considerations" would be adopted, stating the specific reasons for approving the project, based on information contained in the EIR and other information in the record (CEQA Guidelines Section 15093).

1.2 SCOPE OF THIS EIR

This EIR for the proposed Plan is a Program EIR, which CEQA Guidelines Section 15168(a) defines as an EIR that may be prepared on a series of actions that can be characterized as one large project and are related: (1) geographically; (2) as logical parts in the chain of contemplated actions; (3) in connection with the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or (4) as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental impacts that can be mitigated in similar ways.

A Program EIR can provide a comprehensive environmental review for a program of related projects, such as the proposed Plan, that are to be developed over a long period of time. This allows lead agencies to consider program-wide alternatives and cumulative impacts consistently and avoids unnecessary repetition of analysis in subsequent project-specific reviews (see CEQA Guidelines Section 15168(b)).

The degree of specificity in an EIR corresponds to the degree of specificity of the underlying activity being evaluated (CEQA Guidelines Section 15146). This EIR analyzes impacts of the proposed Plan at the same level of detail as the proposed Plan. This EIR provides a foundation for second-tier CEQA documents for subsequent projects, but does not analyze the project-specific impacts of individual projects. Project-specific and site-specific details of subsequent transportation and land use projects will vary widely. When a first-tier Program EIR is prepared, "leaving project-specific details to subsequent EIRs when specific projects are considered" is a proper approach to CEQA tiering (*In re Bay Delta* [2008] 43 Cal. 4th 1143, 1174).

Mitigation measures listed in the EIR are subject to the same rules of specificity and level of detail as the impact analysis. With a Program EIR, detailed project-specific mitigation measures are properly deferred to future project-specific CEQA review (see, e.g., *Koster v. County of San Joaquin* (1996) 47 Cal. App. 4th 29 and CEQA Guidelines Section 15168(b)(4)).

The project-specific impacts and mitigation measures for individual projects will be addressed in future environmental reviews, carried out by the appropriate lead agency in accordance with State and federal law. For a description of the intended uses of this EIR, refer to Chapter 2, Section 2.6. For a detailed discussion of the content and approach to the analysis in this EIR, please see Chapter 4, *Environmental Impact Analysis*. The following 19 resource areas are analyzed in this EIR.

- Aesthetics and Visual Resources
- Agricultural and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology, Soils, and Paleontological Resources
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Mineral Resources
- Noise and Vibration
- Population and Housing
- Public Services and Utilities
- Transportation
- Tribal Cultural Resources
- Water Supply
- Wildfire

1.3 ORGANIZATION OF THIS EIR

This EIR begins with an Executive Summary, which is a condensed version of the EIR identifying the proposed Plan's significant impacts, mitigation measures, and alternatives that would reduce or avoid those impacts; known areas of controversy and issues to be resolved; and how to mitigate significant impacts. Chapter 1 is this *Introduction*.

Chapter 2, *Project Description*, describes the varied aspects of the proposed Plan in sufficient detail to support the impact analysis. The general physical characteristics of the natural and built environments of the San Diego region are described in Chapter 3, *Environmental Setting*. Chapter 4 provides the impact analysis, beginning with a detailed explanation of the approach for the analysis, followed by analysis for 19 different resource areas in Sections 4.1 through 4.19. Each resource area section describes existing conditions (which serve as the baseline for impact analysis), regulatory setting, significance criteria, impact analysis, and mitigation measures (where significant impacts are identified). Section 4.20 summarizes the impacts of the proposed Plan in 2025, 2035, and 2050. Chapter 5 contains the cumulative impacts analysis, while the alternatives to the proposed Plan are discussed and evaluated in Chapter 6. Chapter 7 includes other considerations required by CEQA, including growth inducement, a maximum theoretical build-out scenario, and significant irreversible impacts. Chapter 8 provides the references consulted in preparing this EIR, and Chapter 9 lists the preparers of this environmental document.

This Final EIR reproduces the text of the Draft EIR, and shows changes to the text of the Draft EIR in underline and strikeout format. These changes mainly were made in response to public comments on the Draft EIR, but also include staff-initiated technical corrections and clarifications.

Appendices include the Notice of Preparation (NOP) and written comments received during the NOP period and scoping meeting (Appendix A), as well as technical documents (Appendices B through O) that provide supporting data and information for this EIR. Appendix P, *Response to Comments*, reproduces the comments received on the Draft EIR, and presents the responses to those comments. Appendices A–O are combined and bound together in a document separate from this Final EIR. Due to its size, Appendix P is bound separately.

In compliance with PRC Section 21081.6, a Mitigation Monitoring and Reporting Program (MMRP) will be prepared as a separate document that will be considered after certification of the Final EIR, when the SANDAG Board of Directors considers whether to adopt the proposed Plan.

1.4 LEAD AND RESPONSIBLE AGENCIES

A lead agency is the public agency that has the principal responsibility for carrying out or approving a project (CEQA Guidelines Section 15367). Responsible agencies are other public agencies that propose to carry out or approve a project for which a lead agency is preparing an EIR, including all other agencies that have discretionary approval for a project (CEQA Guidelines Section 15381).

In the case of the proposed Plan and this EIR, SANDAG serves as the lead agency because it is required by federal and State law to prepare and adopt the proposed Plan. No responsible agencies for this EIR have been identified.

1.5 PUBLIC REVIEW AND PARTICIPATION PROCESS

Consistent with CEQA, SANDAG contacted affected agencies, organizations, and individuals who may have an interest in the proposed Plan and EIR. This consultation assisted in defining the scope of this EIR, which is described in Section 1.2.

1.5.1 NOTICE OF PREPARATION

SANDAG initiated the EIR scoping process on November 14, 2016, through the circulation of a NOP. Receipt of the NOP by the State Clearinghouse (Clearinghouse) at the California Office of Planning and Research on November 14, 2016, initiated a 60-day comment period that ended January 13, 2017.

The NOP provided formal notification to all federal, State, and local agencies involved with funding, and to other interested organizations and members of the public, that an EIR will be prepared for the proposed Plan. The NOP was intended to encourage interagency communication concerning the proposed Plan and provide sufficient background information so that agencies, organizations, and individuals could respond to SANDAG with specific comments and questions on the scope and content of this EIR. Appendix A summarizes the issues raised in the NOP comments and identifies the EIR section(s) that address that issue or provides another response to the issue raised as appropriate. The NOP is provided in full in Appendix A-1. The written comments are provided in full in Appendix A-2.

1.5.2 PUBLIC SCOPING

Consistent with CEQA (PRC Section 21083.9), SANDAG noticed and held a public scoping meeting on December 8, 2016, at SANDAG's office at 401 B Street, San Diego, CA 92101. The purpose was to receive perspective and input from agencies, organizations, and individuals on the scope and content of the environmental information to be addressed in the EIR.

1.5.3 COMMENTS ON THE DRAFT EIR

The Draft EIR for the proposed Plan was released to the public on August 27, 2021~~,~~ and was ~~will be~~ available for a 45-day public review period, as required by CEQA. The public review period ended ~~will end~~on October 11, 2021. SANDAG published a Notice of Availability (NOA) for the Draft EIR in local newspapers on August 27, 2021, and mailed the NOA to an extensive distribution list. SANDAG also filed a Notice of Completion (NOC) with the State Clearinghouse to indicate the availability of the Draft EIR for public review and comment on August 27, 2021. In accordance with CEQA Guidelines Section 15204, reviewers ~~should~~ were asked to "focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated."

The Draft EIR and all appendices ~~are~~ were available for review online at www.sdforward.com and at SANDAG offices located at 401 B Street, Suite 800, San Diego, California 92101. The Draft EIR was~~has been~~ distributed to the agencies, organizations, and individuals that provided written comments on the NOP, the SANDAG Board of Directors, SANDAG member agencies, ~~public libraries throughout the region,~~ the San Diego Central Library (which was capable of transferring the document to other local libraires), and other interested parties and stakeholders.

Agencies, organizations, and individuals were~~are~~ invited to provide written comments on the Draft EIR during the public review period from August 27 to October 11, 2021. Comments were asked to~~should~~ be emailed with

subject line "Regional Plan EIR" to: RegionalPlanEIR@sandag.org. Written comments were asked to~~can~~ be addressed and sent to:

San Diego Regional Plan EIR
C/O Kirsten Uchitel, Associate Planner
401 B Street, Suite 800
San Diego, CA 92101

Comments could~~can~~ also be submitted using a comment form at: www.sandag.org/RegionalPlanEIRComments.

Following the public review period, SANDAG ~~will~~ prepared written responses to significant environmental concerns raised in comments on the Draft EIR. The Final EIR ~~will~~ includes revisions to the Draft EIR, comments received on the Draft EIR either verbatim or in summary, and SANDAG responses to significant environmental concerns raised in the public comments. Appendix P contains comments received on the Draft EIR and responses to those comments. The Final EIR and all appendices are available for review online at www.sdforward.com and at SANDAG offices located at 401 B Street, Suite 800, San Diego, California 92101. Certification of the Final EIR and adoption of the proposed Plan are anticipated to be considered by the SANDAG Board of Directors on December 10, 2021.

2 PROJECT DESCRIPTION

The project evaluated in this environmental impact report (EIR) is San Diego Forward: The 2021 Regional Plan ("the proposed Plan") (SANDAG 2021a). The proposed Plan is an update to San Diego Forward: The 2015 Regional Plan ("the 2015 Regional Plan"), adopted in October 2015, and the 2019 Federal Regional Transportation Plan ("the 2019 Federal RTP"), adopted in October 2019. The project location is the San Diego region, shown on Figure 2-1**.** The San Diego region is coterminous with San Diego County.

2.1 PROJECT BACKGROUND

Every 4 years the San Diego Association of Governments (SANDAG) is responsible for preparing an updated Regional Plan in collaboration with the 18 cities and County of San Diego, along with regional, State, and federal partners. The Regional Plan consists of the RTP/SCS for the San Diego region and the RCP. The most recently adopted Regional Plan, San Diego Forward: The 2015 Regional Plan, was approved in October 2015 by the SANDAG Board of Directors.

In October 2019, California Assembly Bill (AB) 1730 (Gonzalez) was signed into law, authorizing a 2-year extension for the RTP/SCS for the San Diego region and deeming the 2015 Regional Plan, its SCS, and Final EIR valid for State compliance, funding eligibility, and other purposes through 2021. SANDAG subsequently completed its 2019 Federal RTP, which complies with federal RTP requirements, achieves air quality objectives of the U.S. Department of Transportation (USDOT), and preserves funding for the region's planned transportation investments. The 2019 Federal RTP updated project costs and revenues and the regional growth forecasted from the 2015 Regional Plan. The 2019 Federal RTP is consistent with the Final EIR for the 2015 Regional Plan certified by the SANDAG Board of Directors on October 9, 2015. Pursuant to AB 1730, the 2019 Federal RTP was not a project for purposes of the California Environmental Quality Act (CEQA).

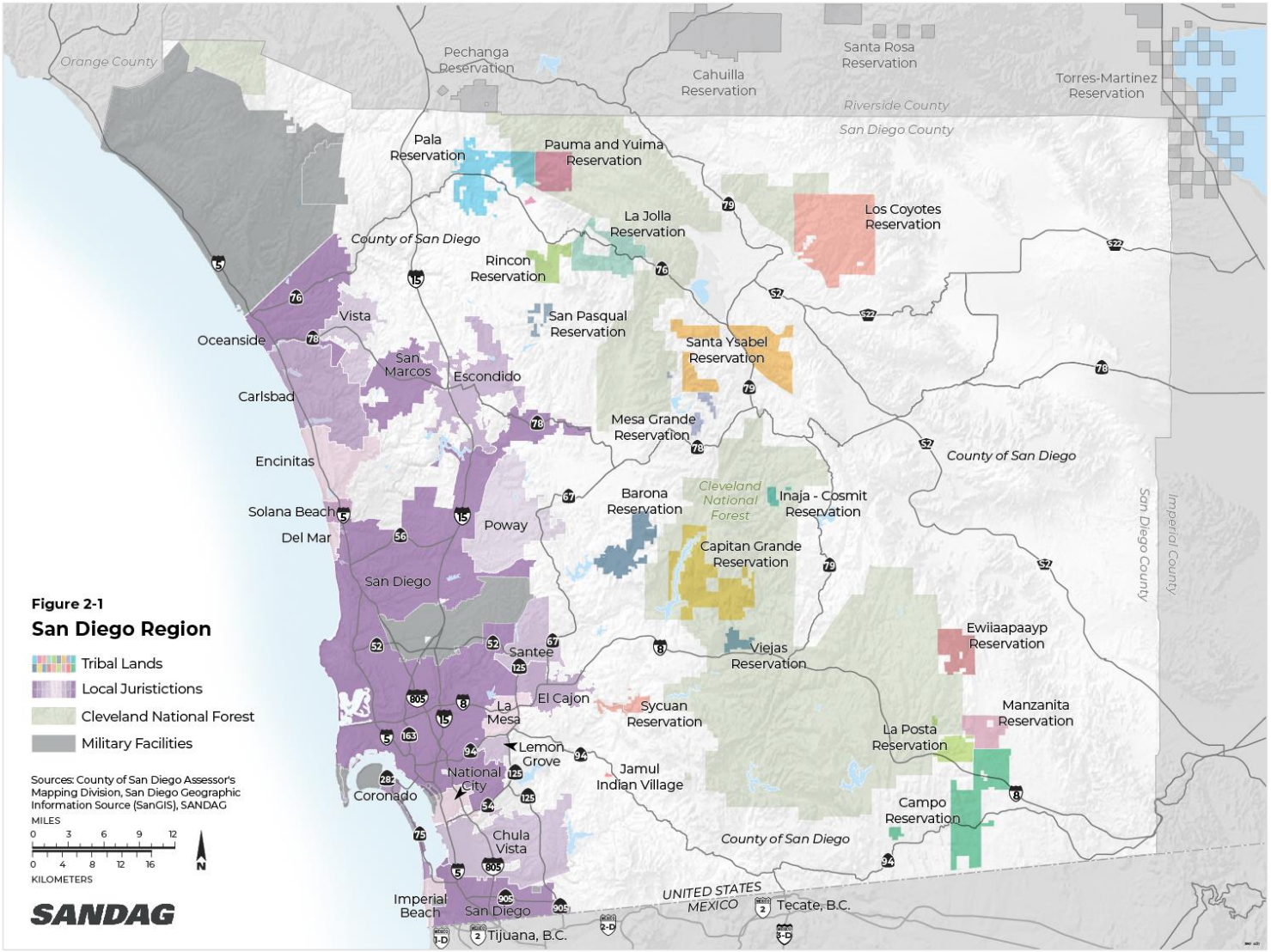
This EIR analyzes the environmental impacts resulting from the proposed Plan.

2.1.1 LEGISLATION INFLUENCING DEVELOPMENT OF THE PROPOSED PLAN

Development of the proposed Plan was guided by federal and State laws and regulations, as well as extensive engagement with the public.

FEDERAL REQUIREMENTS

To be eligible for federal transportation funding, USDOT requires every Metropolitan Planning Organization (MPO) to conduct long-range transportation planning and develop RTPs. Each MPO must develop a 20-year vision and goals plan matched to the unique characteristics of its region. MPOs in areas designated as "nonattainment" or "maintenance" for federal air quality standards must update their RTP every 4 years rather than every 5 years.


Orange County
Pechanga Reservation
Cahuilla Reservation
Santa Rosa Reservation
Torres-Martinez Reservation
Riverside County
San Diego County
Pala Reservation
Pauma and Yuima Reservation
La Jolla Reservation
Los Coyotes Reservation
County of San Diego
Rincon Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Mesa Grande Reservation
Encinitas
Barona Reservation
Cleveland National Forest
Inaja - Cosmit Reservation
Solana Beach
Del Mar
Poway
Capitan Grande Reservation
San Diego
Imperial County
Ewiiaapaayp Reservation
Santee
Viejas Reservation
El Cajon
La Mesa
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Lemon Grove
National City
Jamul Indian Village
Coronado
Campo Reservation
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tecate, B.C.
Tijuana, B.C.
Figure 2-1
San Diego Region
Tribal Lands
Local Jurisdictions
Cleveland National Forest
Military Facilities
Sources: County of San Diego Assessor's Mapping Division, San Diego Geographic Information Source (SanGIS), SANDAG
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Under Federal Highway Administration (FHWA) regulations (23 Code of Federal Regulations [CFR] 450.324, et seq., Metropolitan transportation planning and programming), an RTP must identify "transportation facilities (including major roadways, public transportation facilities, intercity bus facilities, multimodal and intermodal facilities, nonmotorized transportation facilities, and intermodal connectors) that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important national and regional transportation functions" (23 United States Code [USC] 134(i)(2)). RTP transportation network improvements must be "revenue constrained" (23 CFR 450.324(f)(11), meaning that the MPO has specified the public and private funds that are reasonably expected to be available and that are needed to implement the proposed transportation plan.

FHWA federal consultation requirements (23 CFR 450.316) for the proposed Plan include (1) a process involving the MPO, State and local air quality planning agencies, State and local transportation agencies, U.S. Environmental Protection Agency (EPA), and USDOT; and (2) a proactive public involvement process that provides opportunity for public review and comment by, at a minimum, providing reasonable public access to technical and policy information considered by the agency. Pursuant to 176(c) of the federal Clean Air Act (42 USC 7506(c)), SANDAG and USDOT, in consultation with EPA, must determine that the RTP and the Regional Transportation Improvement Program (RTIP) conform to the State Implementation Plan for air quality. The Air Quality Conformity Analysis for the proposed Plan is provided in Appendix C of the proposed Plan. See the proposed Plan's Appendices C, G, H, N, O, and Q for documentation of federal consultation requirements.

CALIFORNIA REQUIREMENTS

In addition to USDOT requirements, the proposed Plan is guided by several California statutory requirements.

California Regional Transportation Plan Guidelines

The State statutory requirements for RTPs are found in Government Code Section 65080 et seq., which states that an RTP must contain:

- A Policy Element that reflects the mobility goals, policies and objectives of the region.
- An Action Element that identifies programs and actions to implement the RTP.
- A Financial Element that summarizes the cost of implementing the projects in the RTP in a financially constrained environment.

The California Transportation Commission (CTC) has issued RTP Guidelines (CTC 2017) to clarify the planning practices needed to meet State statutory requirements for RTPs.

California Global Warming Solutions Act of 2006

The California Global Warming Solutions Act of 2006 (AB 32, Chapter 488, Statutes of 2006) required the California Air Resources Board (CARB) to develop and enforce regulations for reporting, verifying, and reducing statewide greenhouse gas (GHG) emissions to 1990 levels by 2020. The law requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

AB 32 requires that CARB develop a Climate Change Scoping Plan (Scoping Plan) consisting of the main strategies California will implement to reduce statewide GHG emissions to 1990 levels by 2020. It must be

updated every 5 years. CARB released its initial Scoping Plan in 2008, with updates in 2014 and 2017. The 2017 Scoping Plan identifies how California can reach its 2030 climate target to reduce GHG emissions by 40 percent from 1990 levels, and substantially advance toward the State's 2050 climate goal to reduce GHG emissions by 80 percent below 1990 levels.

Sustainable Communities and Climate Protection Act of 2008

To help implement AB 32, the California Legislature passed the Sustainable Communities and Climate Protection Act of 2008 (Senate Bill [SB] 375, Chapter 728, Statutes of 2008), one of several steps the State has taken to implement AB 32. SB 375 required CARB to set regional targets for reducing GHG emissions from passenger vehicle use. In 2010, CARB established targets for 2020 and 2035 for each region in California governed by an MPO. SANDAG is the MPO for the San Diego region. SANDAG's State-mandated target is to reduce regional emissions of GHGs from cars and light trucks by 15 percent, per capita, by 2020, compared with a 2005 baseline (CARB 2017). By 2035, a 19 percent reduction is required. The Sustainable Communities Act does not require CARB to establish post-2035 targets.

To achieve the targets, SANDAG and other MPOs are required to develop an SCS as a component of the RTP. The SCS is required by Government Code Section 65080(b)(2)(B) to:

- Identify the general location of uses, residential densities, and building intensities within the region.
- Identify areas within the region sufficient to house all the population of the region, including all economic segments of the population.
- Identify areas within the region sufficient to house an 8-year projection of the regional housing need for the region.
- Identify a transportation network to serve the transportation needs of the region.
- Gather and consider the best practically available scientific information regarding resource areas and farmland in the region.
- Consider specified State housing goals.
- Set forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportation measures and policies, will reduce the GHG emissions from automobiles and light trucks, to achieve, if there is a feasible way to do so, the GHG emission reduction targets approved by CARB.
- Allow the RTP to comply with federal Clean Air Act requirements related to air quality conformity.

Under SB 375, an SCS cannot be interpreted to supersede the land use authority of cities and counties within the region. Chapter 2 of the proposed Plan focuses on the SCS; however, components of the SCS are integrated throughout the Regional Plan chapters and appendices.

Appendix D of the proposed Plan documents compliance with SCS requirements and provides SCS-related background information.

Regional Housing Needs Assessment

The Regional Housing Needs Assessment (RHNA), required by State law (Government Code Section 65584[a]), quantifies the need for housing in the region and informs land use planning in addressing identified existing and future housing needs resulting from population, employment, and household growth.

As a council of governments, SANDAG is responsible for overseeing the RHNA process for the San Diego region. SANDAG, in consultation with the California Department of Housing and Community Development (HCD), assessed the region's housing needs in four income categories—very low, low, moderate, and above moderate. SANDAG and its member agencies developed a methodology for allocating a share of the RHNA Determination to each jurisdiction. SB 375 requires the RHNA to be integrated with the SCS.

Regional Comprehensive Plan for the San Diego Region

California law (AB 361, Chapter 508, Statutes of 2003) governs the contents and process for updates of the RCP for the San Diego region. Under AB 361, the RCP must be based on local general and regional plans and integrate land uses, transportation systems, infrastructure needs, and public investment strategies, within a regional framework, in cooperation with member agencies and the public. The RCP must be updated as necessary and be consistent with the RTP. Beginning with the 2015 Regional Plan, the RCP requirements have been integrated with the RTP/SCS in the Regional Plan.

Public Involvement Program for the Proposed Plan

To support the development of the proposed Plan, SANDAG implemented a comprehensive public outreach and involvement program consistent with State and federal requirements. Early in the planning process, SANDAG developed a Public Involvement Plan (PIP) to guide the public outreach program, which was updated in mid-2019. The PIP identifies public engagement techniques to involve the public and collect input for the proposed Plan, including public workshops, social media, visualizations, and other means. It describes how to connect with hard to reach communities such as tribal nations and low-income and minority populations. A detailed description of the PIP can be found in Appendix G of the proposed Plan.

2.2 PROPOSED PLAN BACKGROUND

The Vision of the proposed Plan is "A fast, fair, and clean transportation system and a resilient region." The proposed Plan sets three primary goals to achieve this Vision:

- The efficient movement of people and goods.
- Access to affordable, reliable, and safe mobility options.
- Healthier air and reduced GHG.

To achieve these goals, the proposed Plan uses a framework of coordinated land use and transportation strategies:

- **Invest in a reimagined transportation system**: Build a network and fund services that include multimodal roadways; an expanded network of fast, frequent, and low-cost transit; 21st century technology that manages the entire transportation system and connects people to on-demand services; and zero-emission options for vehicles and *micromobility*, which includes small, low-speed vehicles such as e-scooters, bikes, and other rideables that support short trips around a community.

- **Incentivize sustainable growth and development**: Collaborate with local jurisdictions and fund programs to accelerate housing production while also addressing equity, climate resilience, and mobility.
- **Implement innovative demand and system management**: Reduce solo driving and congestion through increased remote work, carsharing, vanpooling, pricing strategies, and parking management programs that leverage partnerships and technology.

2.2.1 DEVELOPMENT OF THE PROPOSED PLAN: A DATA DRIVEN PROCESS

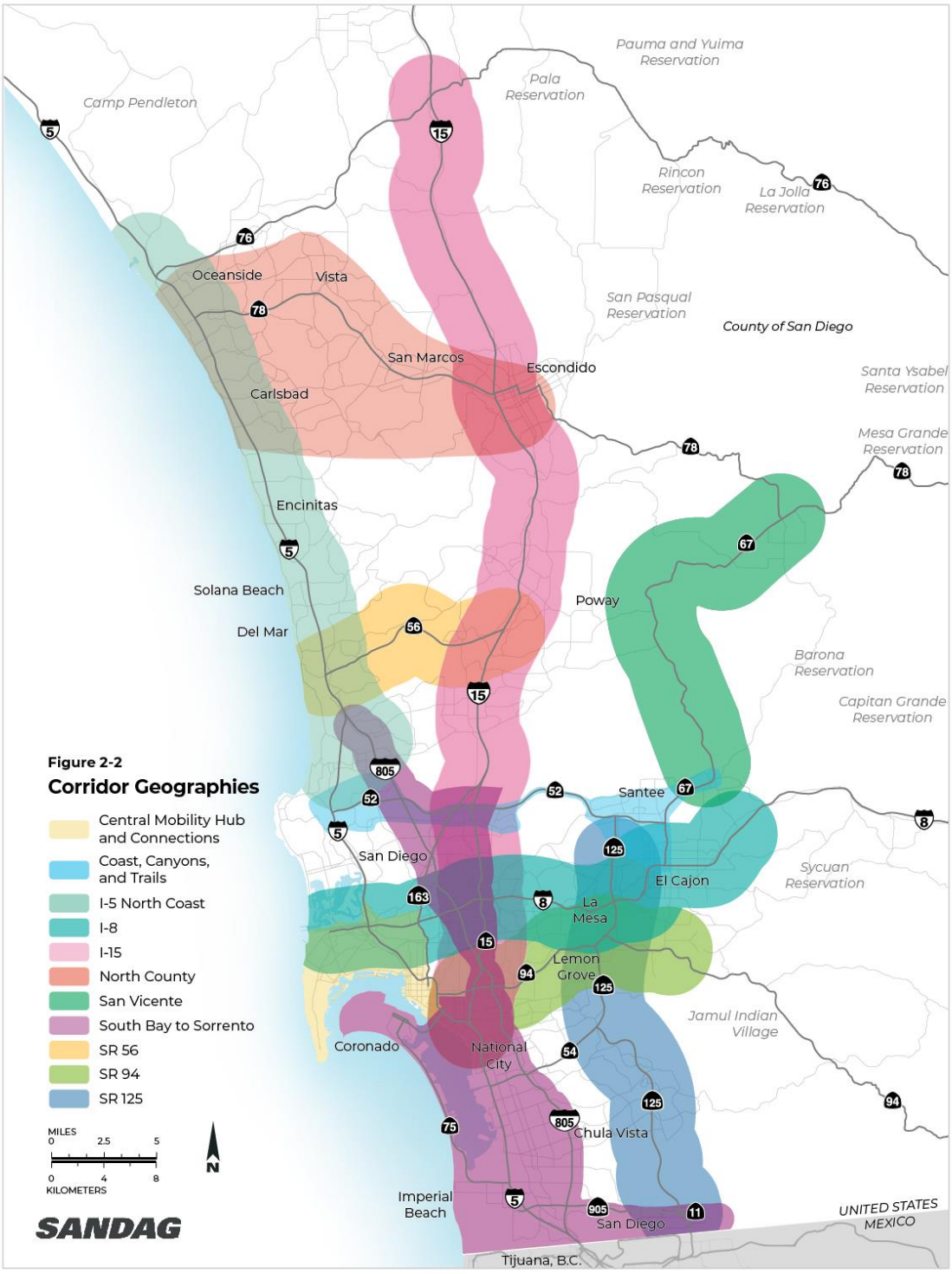
The general concept for the proposed Plan was informed significantly by early work on the 2019 Regional Plan, which led to the 2019 Federal RTP. This work included a four-phased approach: concept development, network development, network refinement, and transportation system validation. Additional information about the four phases can be found in Appendix T of the proposed Plan.

Based on regional travel data, SANDAG identified critical regional nodes for travel connections for trips taken to and from the top 15 employment centers in San Diego County. These nodes and connections, along with data gathered from public outreach efforts, were used to develop the proposed Plan's 5 Big Moves: Complete Corridors, Transit Leap, Mobility Hubs, Flexible Fleets, and Next OS. Each of these elements is discussed in greater detail in Section 2.5.1, *The 5 Big Moves*.

The proposed Plan deploys the 5 Big Moves across the region's Rural and 11 Major Travel Corridors. Figure 2-2 depicts these Major Travel Corridor geographies, which are:

- ~~San Vicente~~
- South Bay to Sorrento
- Central Mobility Hub
- State Route 125 (SR 125)
- Interstate 15 (I-15)
- Interstate 5 (I-5) North Coast Corridor
- State Route 94 (SR 94)
- Interstate 8 (I-8)
- Coast, Canyons, and Trails
- State Route 56 (SR 56)
- San Vicente
- North County

Figures 2-2.1 through 2-2.11 depict each corridor in more detail.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Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
San Pasqual Reservation
County of San Diego
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Escondido
Carlsbad
Santa Ysabel Reservation
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-2
Corridor Geographies
Central Mobility Hub and Connections
Coast, Canyons, and Trails
I-5 North Coast
I-8
I-15
North County
San Vicente
South Bay to Sorrento
SR 56
SR 94
SR 125
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG

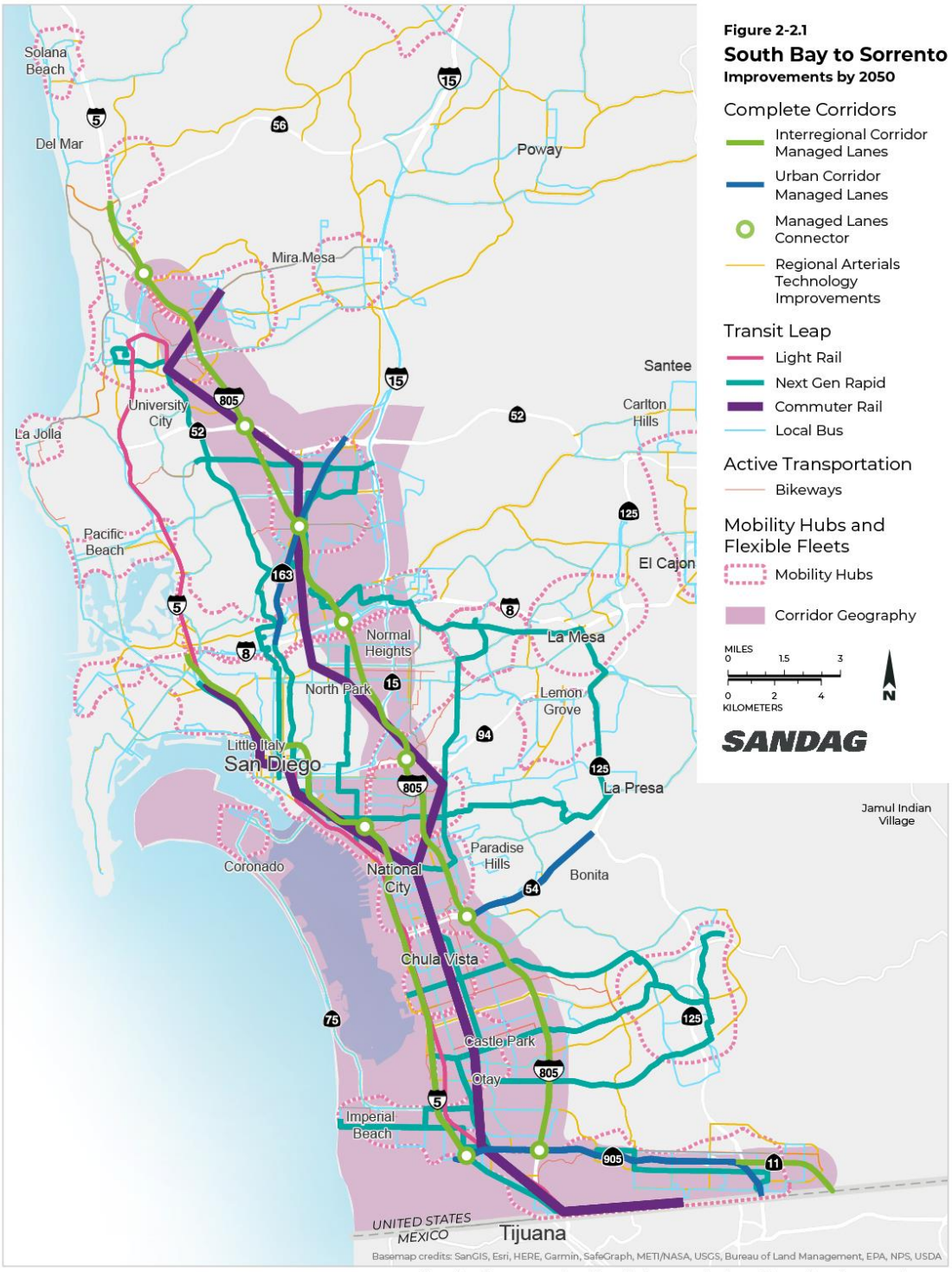

Figure shows improvements along this corridor. Investments in other corridors are shown in corresponding maps.

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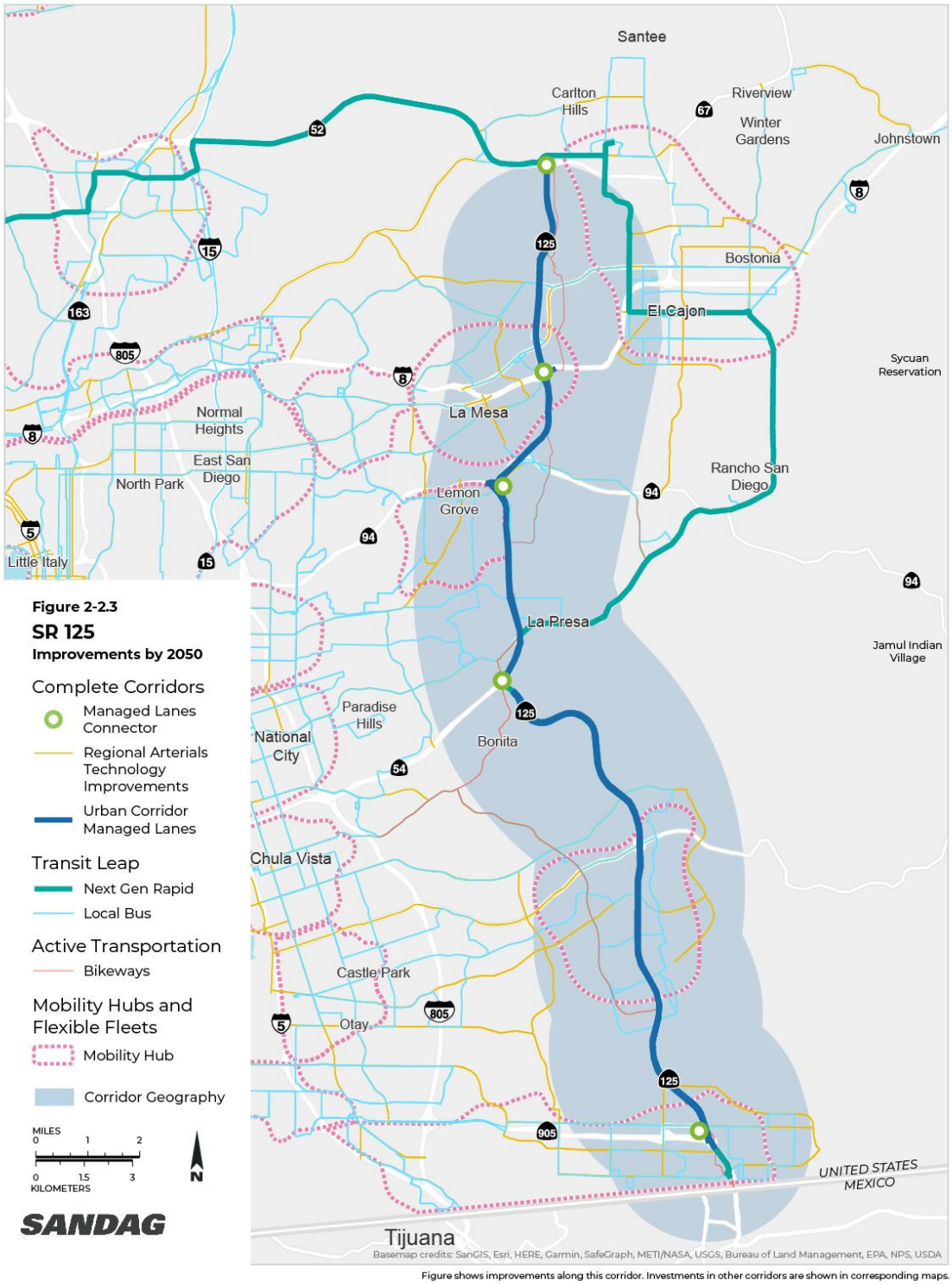

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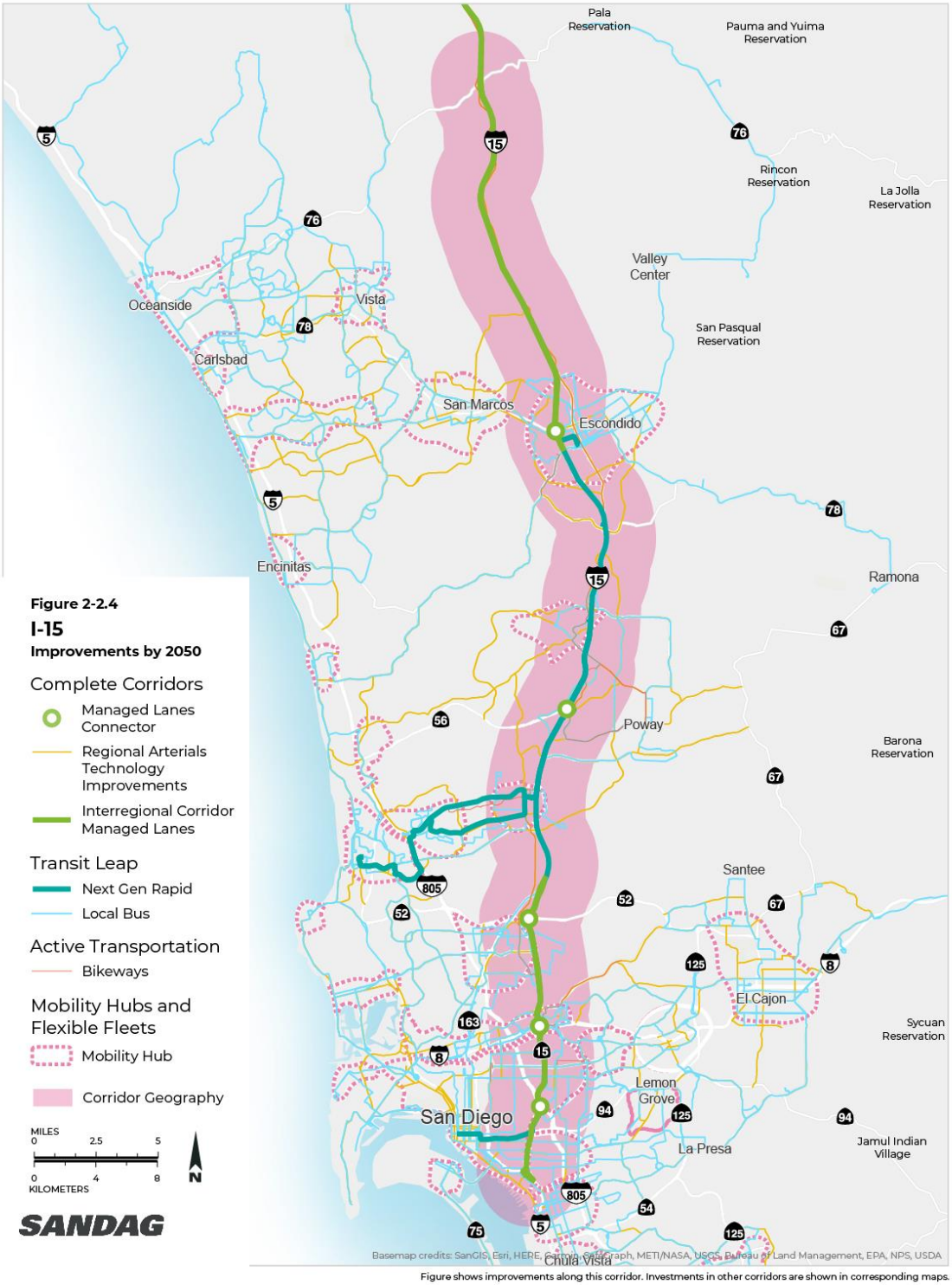
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Valley Center
San Pasqual Reservation
Oceanside
Vista
Carlsbad
San Marcos
Escondido
Encinitas
Ramona
Poway
Barona Reservation
Santee
El Cajon
Sycuan Reservation
Lemon Grove
San Diego
La Presa
Jamul Indian Village
Chula Vista
Basemap credits: SanGIS, Esri, HERE, Garmin, OpenStreetMap, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA
Figure 2-2.4
I-15
Improvements by 2050
Complete Corridors
Managed Lanes Connector
Regional Arterials Technology Improvements
Interregional Corridor Managed Lanes
Transit Leap
Next Gen Rapid
Local Bus
Active Transportation
Bikeways
Mobility Hubs and Flexible Fleets
Mobility Hub
Corridor Geography
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Figure shows improvements along this corridor. Investments in other corridors are shown in corresponding maps.

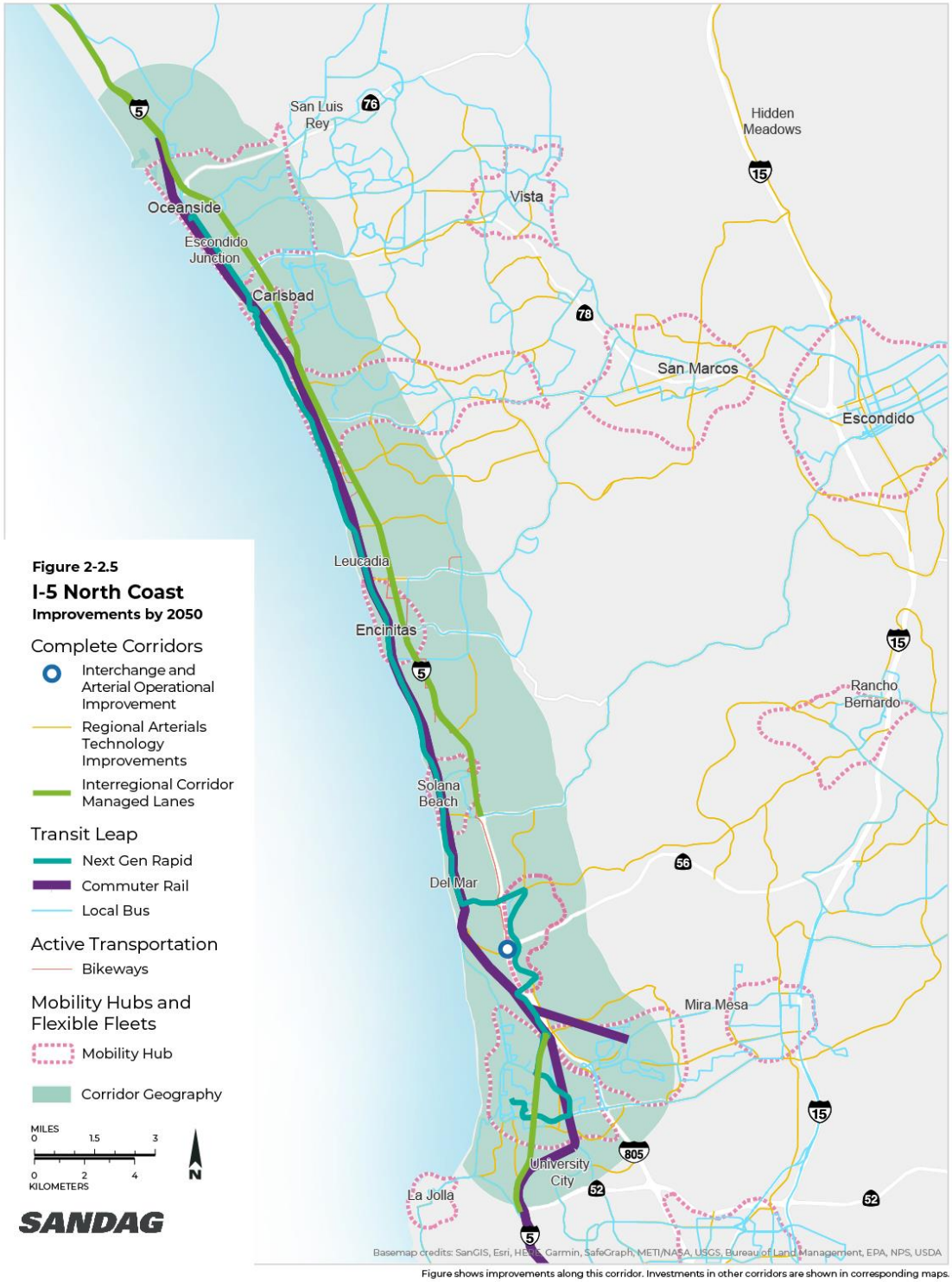

Figure shows improvements along this corridor. Investments in other corridors are shown in corresponding maps.

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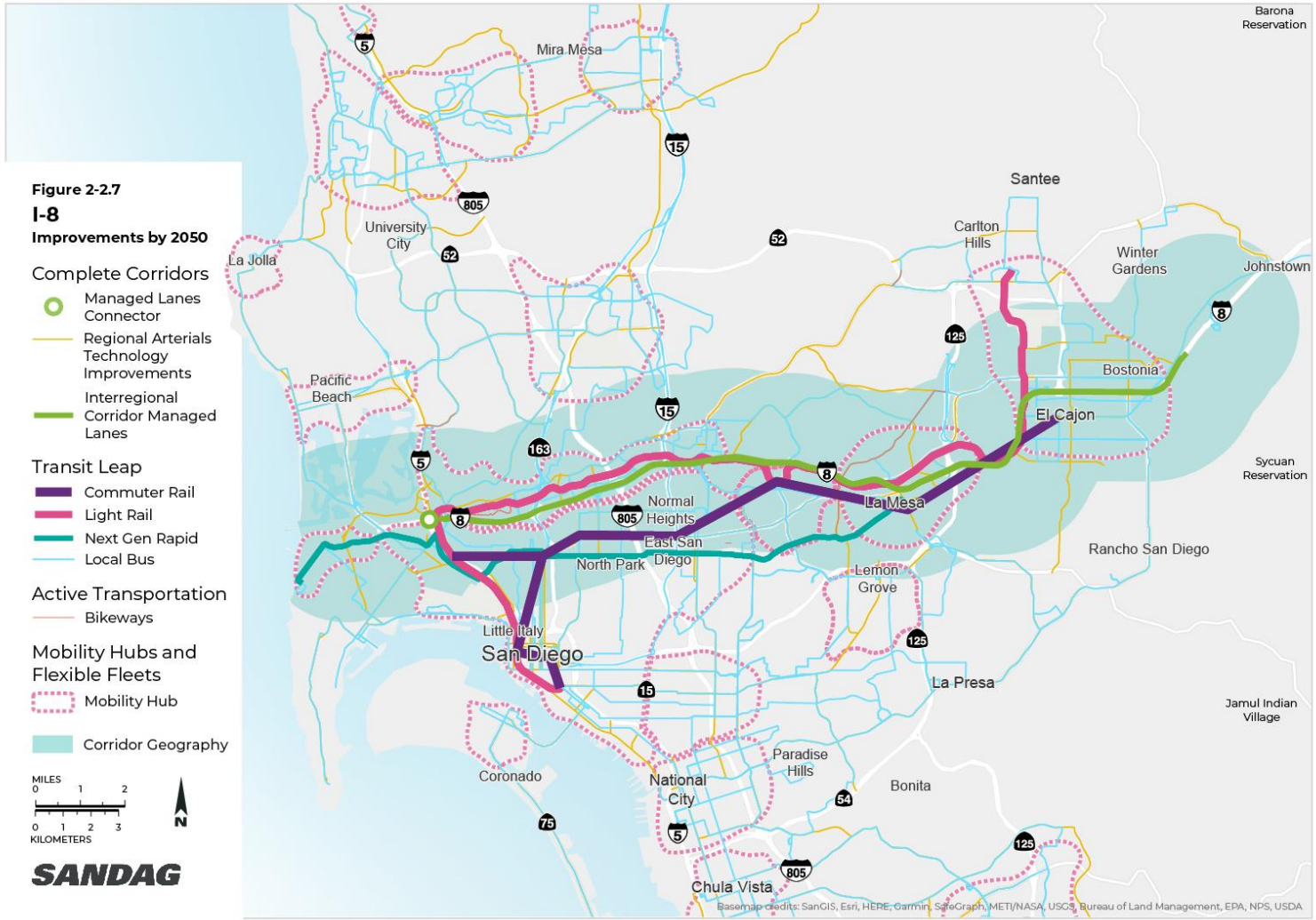


Figure shows improvements along this corridor. Investments in other corridors are shown in corresponding maps.

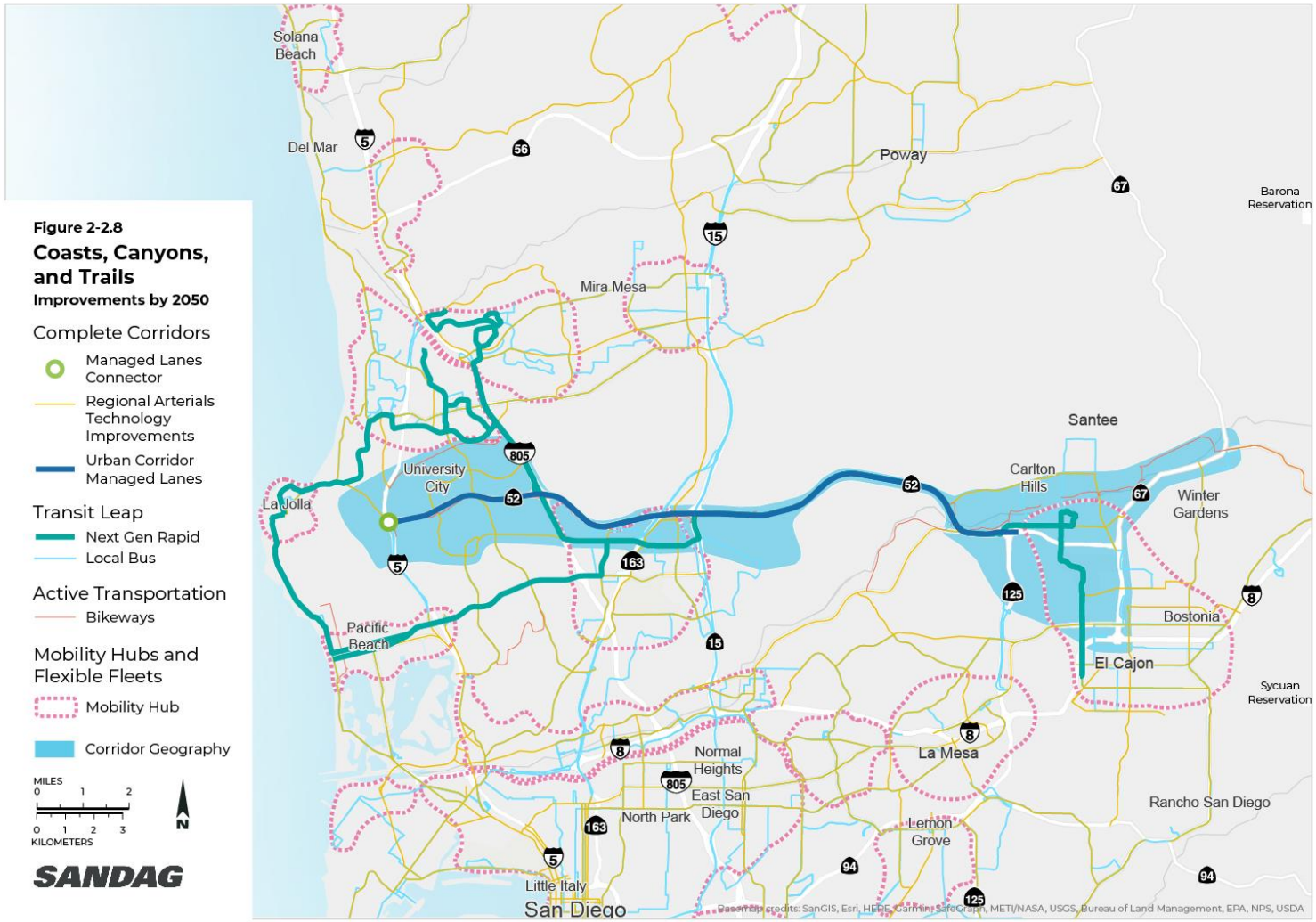


Figure shows improvements along this corridor. Investments in other corridors are shown in corresponding maps.

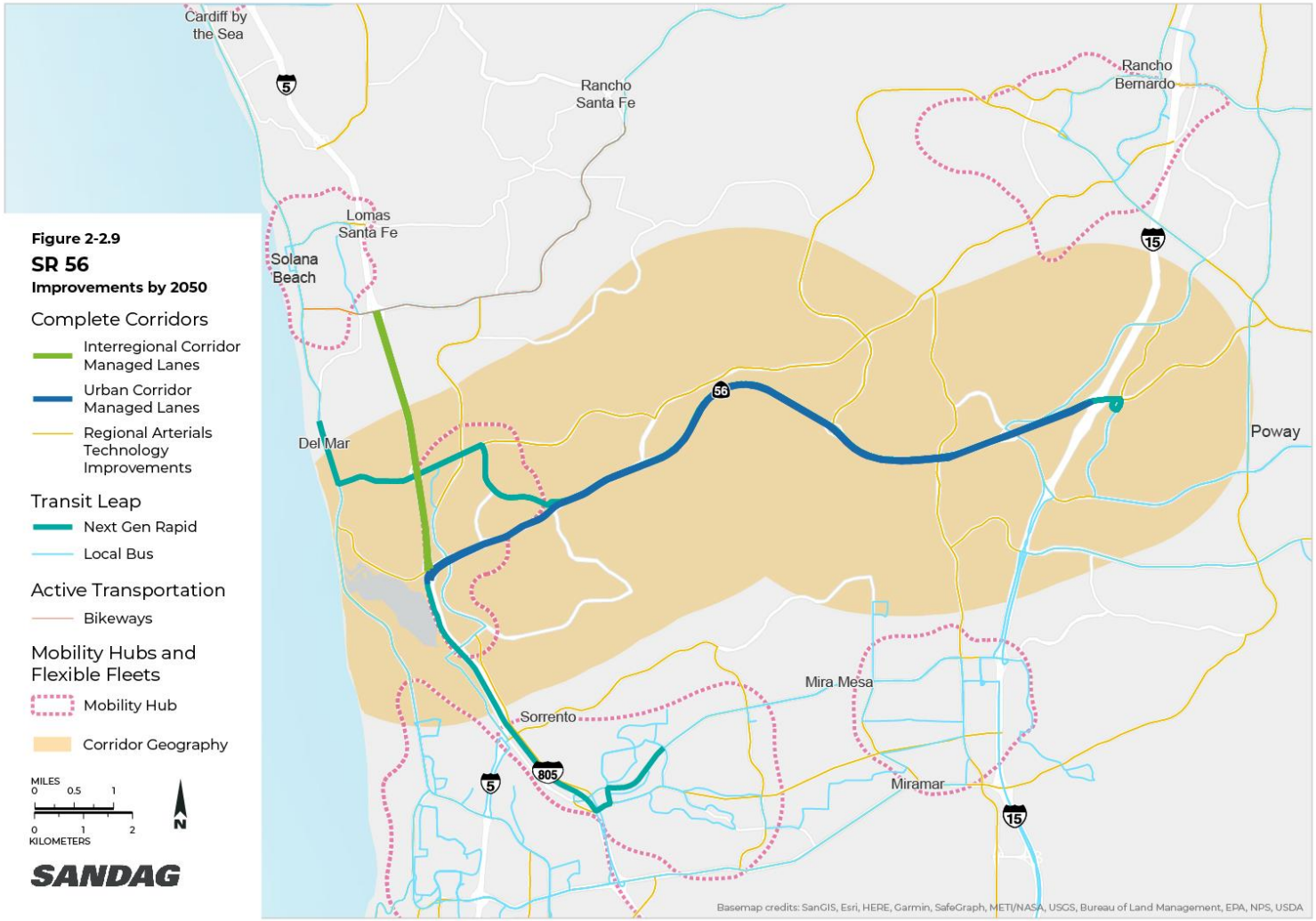


Figure shows improvements along this corridor. Investments in other corridors are shown in corresponding maps.

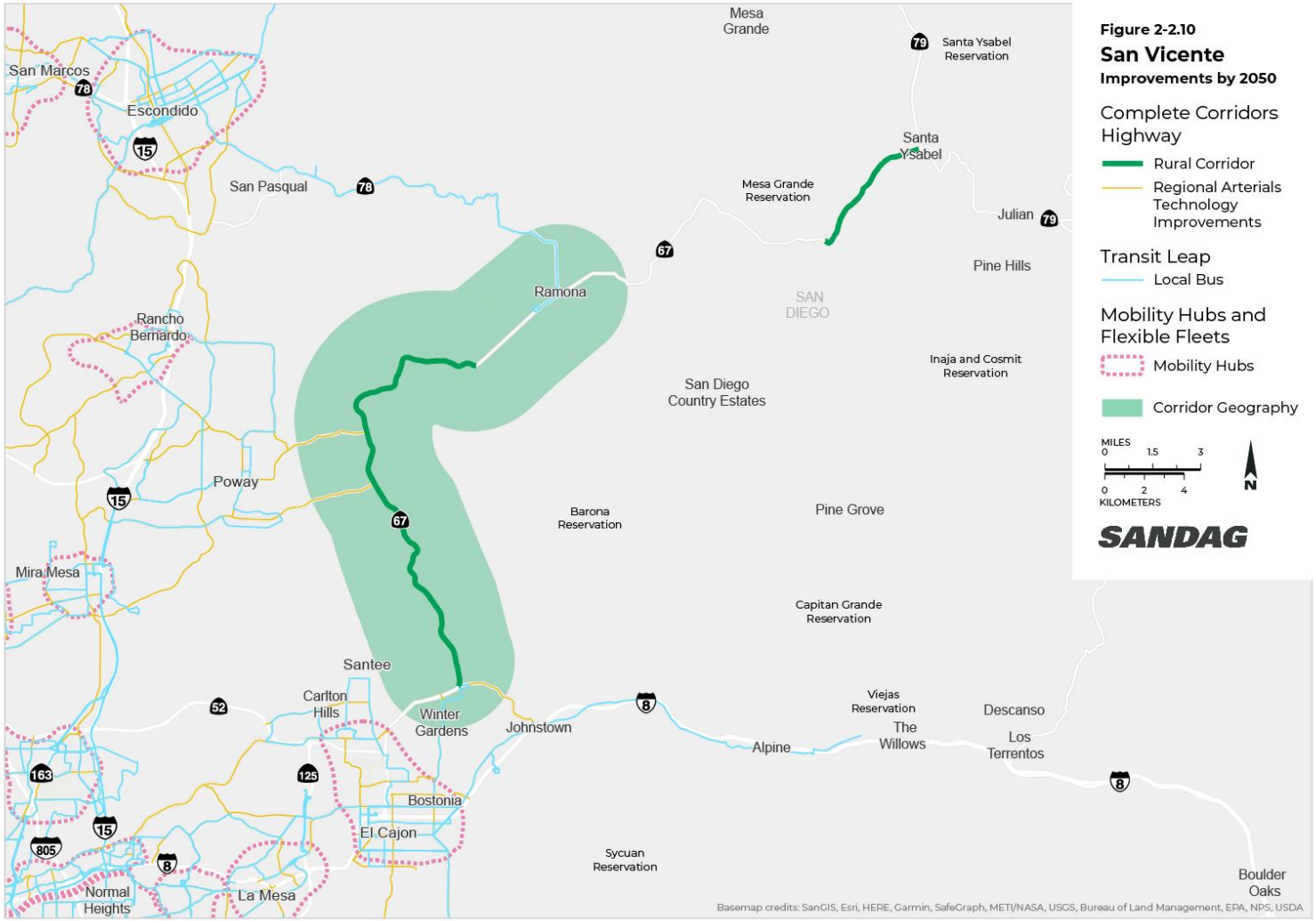


Figure shows improvements along this corridor. Investments in other corridors are shown in corresponding maps.

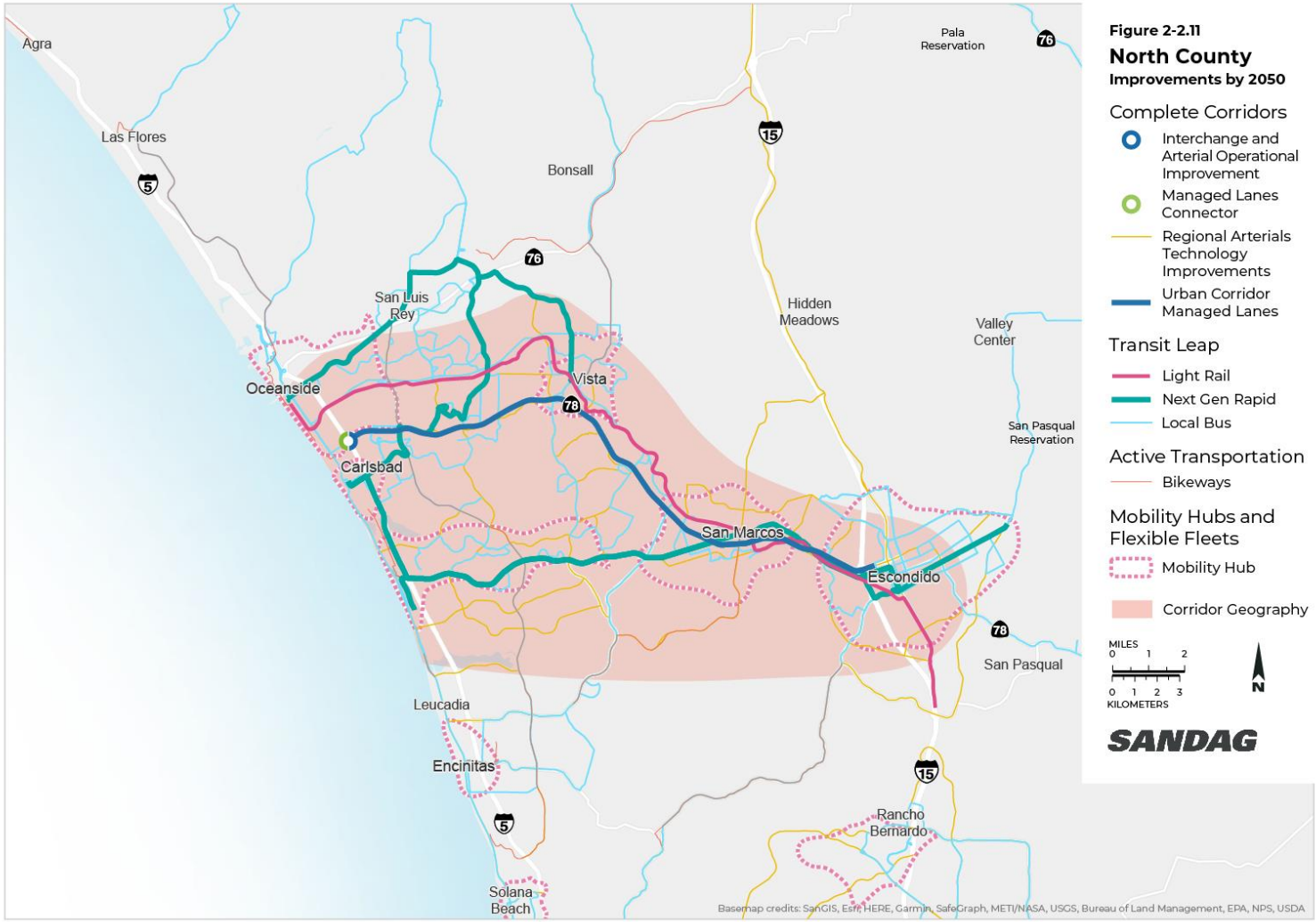


Figure shows improvements along this corridor. Investments in other corridors are shown in corresponding maps.

2.2.2 SAN DIEGO REGIONAL GROWTH FORECAST

DEVELOPMENT OF THE REGIONAL GROWTH FORECAST

Since 1972, every 3–4 years SANDAG produces a long-range forecast of population, housing, and employment that is used as a resource by public agencies, elected officials, planners, academics, and the general public. Among other applications (including general plans and infrastructure planning), the Series 14 Regional Growth Forecast (Series 14) aligns with the regional forecast from the California Department of Finance (DOF) and is the basis for the proposed Plan.

The forecast process includes two main phases. First, a forecast for the region is produced based on population projections from DOF and rates developed by SANDAG that are based on historic economic and demographic trends (SANDAG 2017). Future job growth is based on projected employment by industry from California Economic Development Department (EDD) data.

The second phase allocates the forecasted growth down to the jurisdictions and smaller geographic areas. SANDAG staff works with the region's 18 cities, the County of San Diego, and other agencies that manage land use (e.g., the Department of Defense, tribal governments) to understand local land use plans and policies, including general plans, community plans, or specific plans, as well as constraints to development (e.g., floodplains, steep slopes, habitat preserves, historic districts, etc.), and permitted projects in the development pipeline. That detailed land use information along with information on proximity to existing job centers, and historical development patterns is incorporated into the future development and redevelopment projections that comprise the subregional projections.

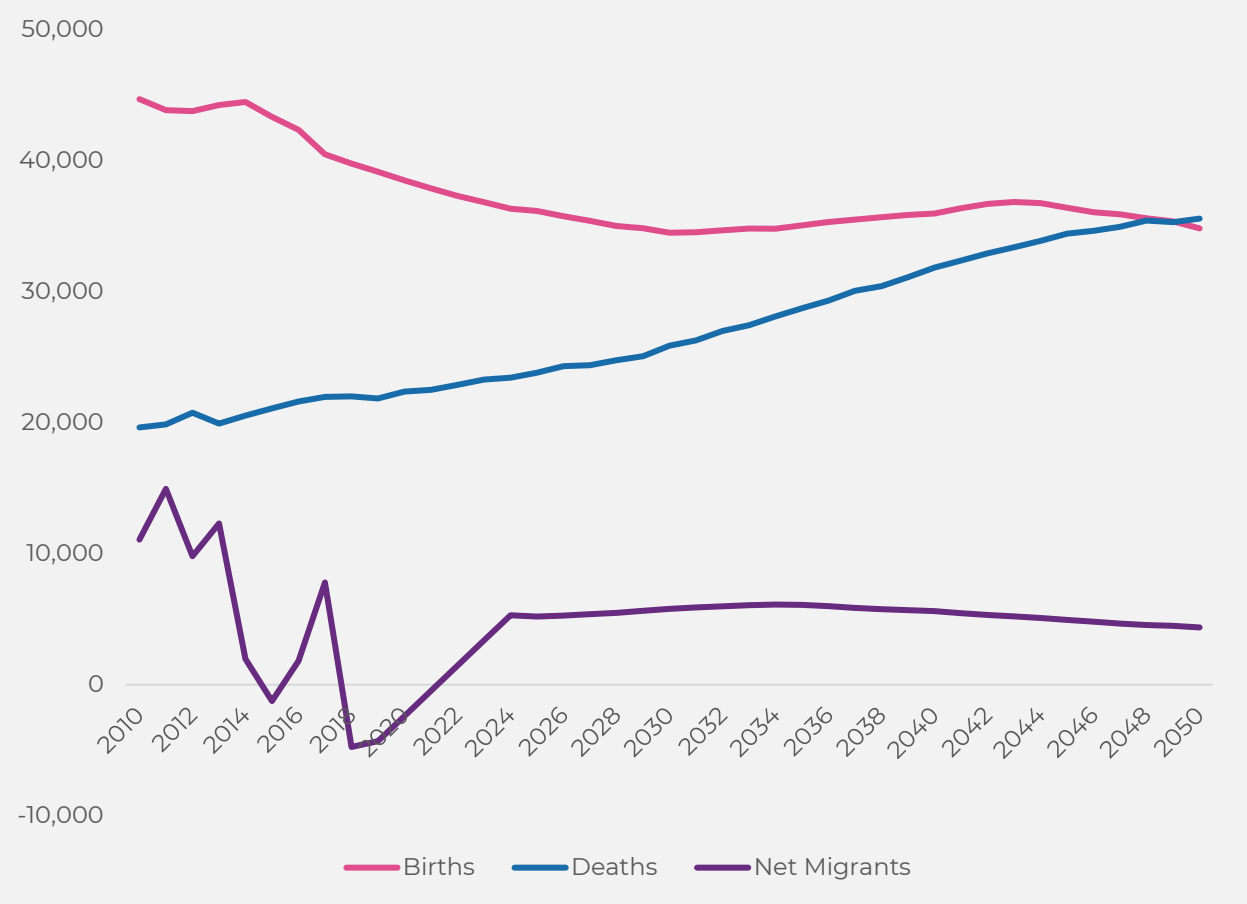
During the 34-year forecast period, the general trend for population growth is positive, but slowing considerably when compared with past forecasts. Currently, estimates from DOF show that between 2010 and 2020, growth rates for the San Diego region dropped from over 1 percent per year, to less than half a percent by 2020. At the beginning of the 2010s, San Diego grew by more than 30,000 persons per year. However, by the end of the decade the region grew by less than 20,000 persons. These projections show that by the 2030s growth will slow to about 0.4 percent per year and decrease after 2040 to 0.3 percent per year, or less than 10,000 persons entering the region yearly. (DOF 2021, SANDAG 2021b.)

Figure 2-3 shows the components of population change for the region. Populations grow or shrink by only three mechanisms: births, deaths, and migration. Figure 2-3 shows the count of births, deaths, and net migrants (in-migrants minus out-migrants) from 2010 to 2050. By the end of the 2040s births and deaths actually cross, meaning that for the first time in the history of the region, there will be population decline due to more deaths in the region than births. Foreign immigration is controlled by the federal government and the number of approved foreign immigrant petitions has remained largely consistent over the past decade. No major change in immigration levels is expected in the foreseeable future. Domestic migration—people moving to and from other parts of the state or nation—has been slowing in the country, with the lowest observed rates since the 1940s (Frey 2020).

This slowing population growth is attributed to declines in in-migration to the region by both migrants from other states and from other countries, as well as to the slowing birth rates by the resident population. Both these trends compound in the future to predict very slow growth in the San Diego region in the coming decades. This coupled with improvements to life expectancy will contribute to a substantial proportion of the population

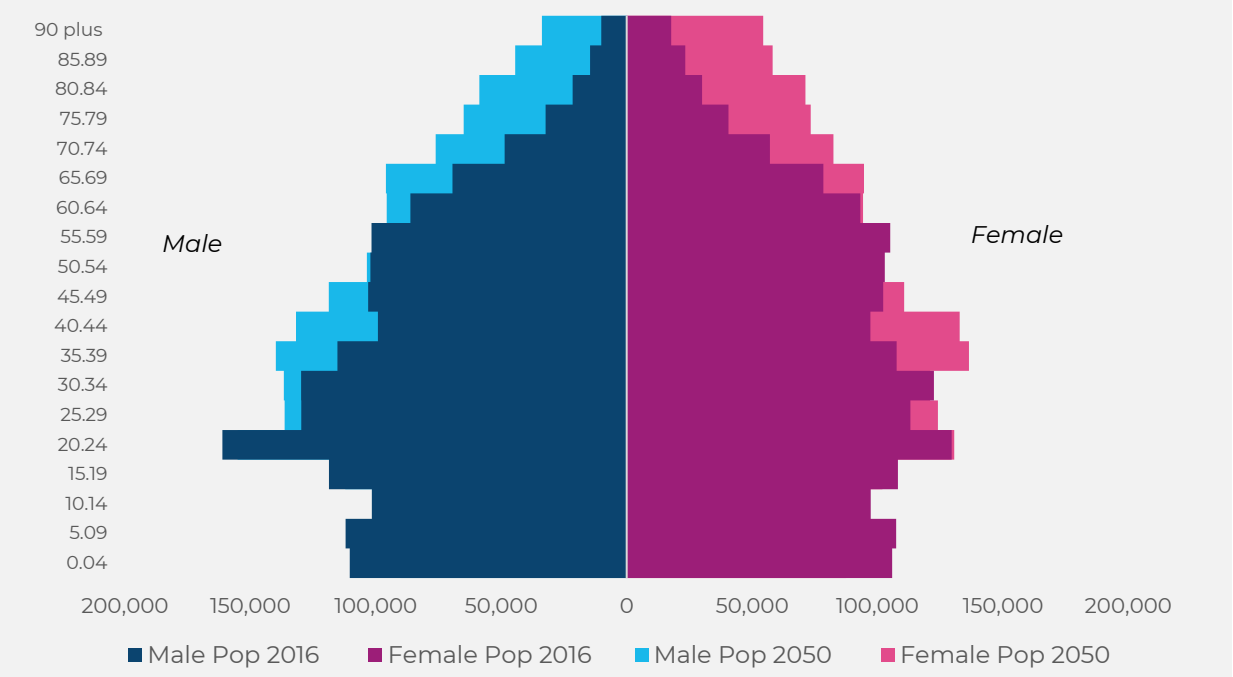
in the region being over age 65. Of course, this trend is not unique to San Diego, with much of the U.S. experiencing fertility declines and improvements to life expectancy in the future. By 2030, when all baby boomers have reached age 65, one in every five residents will be retirement age in the United States (U.S. Census 2018). Figure 2-4 shows the age and sex composition of the population in 2016 and 2050. This shows the relative growth in older ages versus younger ages and the mortality gains projected for the coming decades. As shown in Figure 2-4, there is a projected increase in the population in the working ages by mid-century and improvements to life expectancy, which will result in better survival for both men and women at older ages.

Figure 2-3. Components of Population Change, San Diego Region 2010–2050



Source: California Department of Finance Population Projections, January 2020

Figure 2-4. Population by Age and Sex, San Diego Region 2016 and 2050



Source: SANDAG Series 14 Regional Growth Forecast

In terms of race and ethnic composition, the region will continue to be diverse with the non-Hispanic white population decreasing and almost all other racial and ethnic groups increasing over the forecast horizon.[1] In 2016 the largest race and ethnic groups in the region are non-Hispanic Whites and Hispanics, comprising 46 and 34 percent of the total regional population, respectively (SANDAG 2021a). By 2050, however, it is expected that Hispanics will account for almost 40 percent of the total population while the non-Hispanic White population will decline to approximately 31 percent (SANDAG 2021b). The Asian population is expected to increase to 19 percent; up from 11 percent in 2016 (SANDAG 2021a, 2021b). Non-Hispanic Blacks, two or more races, native Hawaiian or Pacific Islanders, and American Indian or Alaskan Natives each comprise less than 5 percent of the total population today and are expected to remain relatively unchanged out to 2050 (SANDAG 2021b). It is important to emphasize that while the region's rate of population growth is slowing, the region is still growing. These forecasts can help inform local and regional policies in planning for the future.

REGIONAL GROWTH AND LAND USE CHANGE, 2016–2050

Table 2-1 summarizes the existing and forecasted growth in the region through 2050. Additional detail by jurisdiction is provided in subsequent sections.

Table 2-1
Series 14 San Diego Regional Growth Forecast and SCS Land Use Pattern

Year	Population	Housing Units	Jobs
2016	3,309,510	1,190,555	1,646,419
2025	3,470,848	1,288,216	1,761,747
2035	3,620,348	1,409,866	1,921,475
2050	3,746,073	1,471,299	2,086,318
2016–2050	436,563	280,744	439,899
Percent change 2016–2050	13%	24%	27%

Source: SANDAG 2021b.

Population

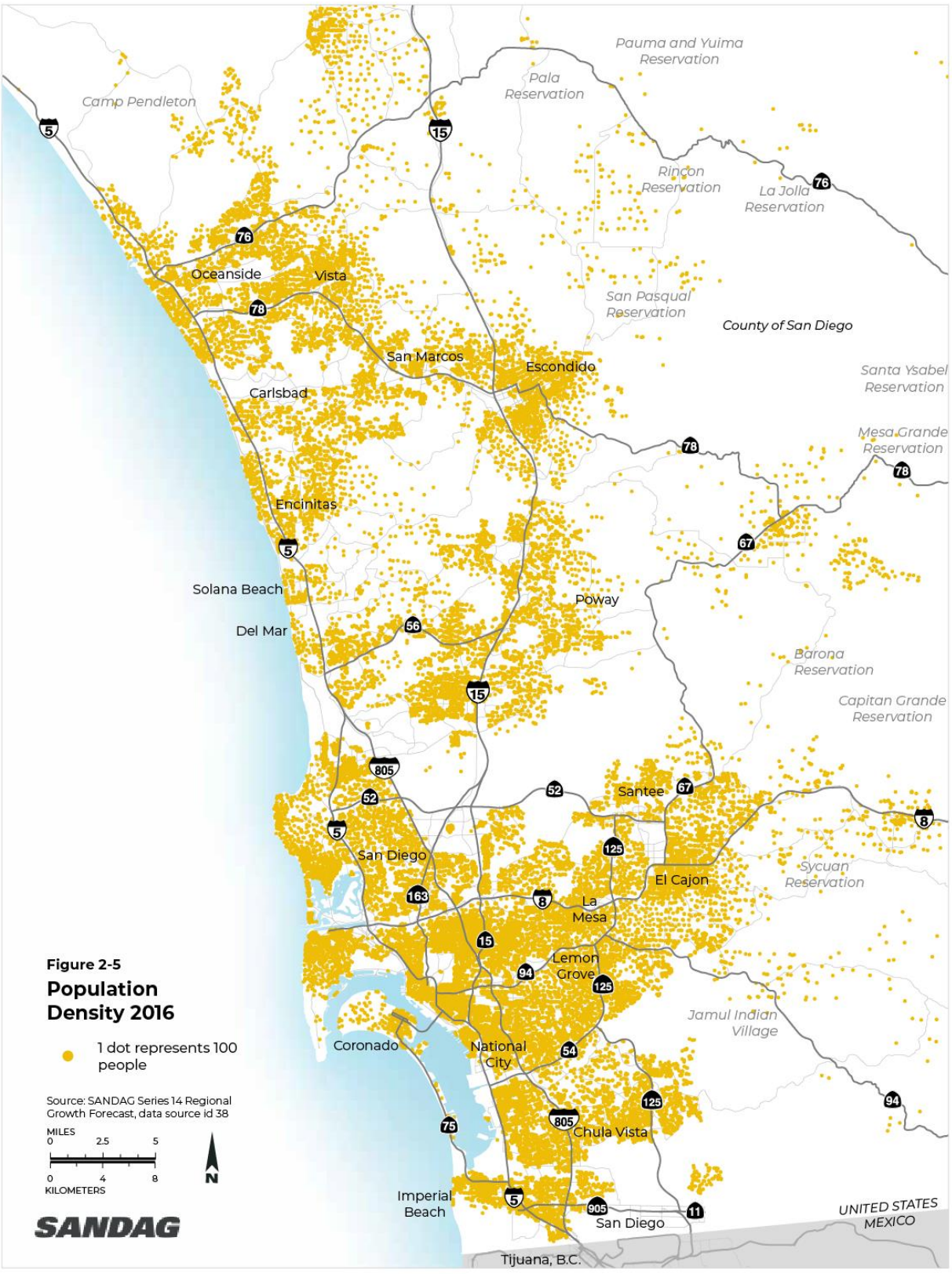
From 2016 to 2050, regional population is forecasted to increase by 436,563 people from 3,309,510 to 3,746,073, an increase of 13 percent, as shown in Table 2-2. Table 2-2 and Figures 2-5 through 2-8 show existing population in 2016 and forecasted population growth for 2025, 2035, and 2050 by jurisdiction.

[1] Racial and ethnic groups in the SANDAG Regional Growth Forecast are mutually exclusive. All racial groups are non-Hispanic, and Hispanics can be of any race.

Table 2-2
Existing and Forecasted Population Growth by Jurisdiction

Jurisdictions	2016	2025	2035	2050	Increase (2016–2050)	
					Population	Percent
Carlsbad	113,179	116,163	119,681	122,302	9,123	8%
Chula Vista	265,357	284,835	288,141	323,469	58,112	22%
Coronado	24,512	24,896	25,669	25,901	1,389	6%
Del Mar	4,284	4,384	4,524	4,715	431	10%
El Cajon	105,276	106,425	109,207	110,841	5,565	5%
Encinitas	62,625	63,476	64,157	64,591	1,966	3%
Escondido	150,978	165,127	169,922	174,398	23,420	16%
Imperial Beach	28,041	28,902	30,499	31,271	3,230	12%
La Mesa	60,980	65,822	71,455	75,276	14,296	23%
Lemon Grove	26,710	27,367	29,238	29,784	3,074	12%
National City	61,350	69,072	79,986	82,487	21,137	34%
Oceanside	176,666	178,385	181,020	184,283	7,617	4%
Poway	49,986	50,664	51,744	52,124	2,138	4%
San Diego	1,399,925	1,493,403	1,599,353	1,646,129	246,204	18%
San Marcos	94,258	102,775	103,903	120,247	25,989	28%
Santee	56,434	57,501	57,773	58,268	1,834	3%
Solana Beach	13,860	14,171	15,089	15,262	1,402	10%
Vista	102,933	104,302	105,707	107,732	4,799	5%
Unincorporated	512,156	513,178	513,280	516,993	4,837	1%
Region	3,309,510	3,470,848	3,620,348	3,746,073	436,563	13%

Source: SANDAG 2021b.


Pauma and Yuima Reservation
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Tijuana, B.C.
Figure 2-5
Population Density 2016
1 dot represents 100 people
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
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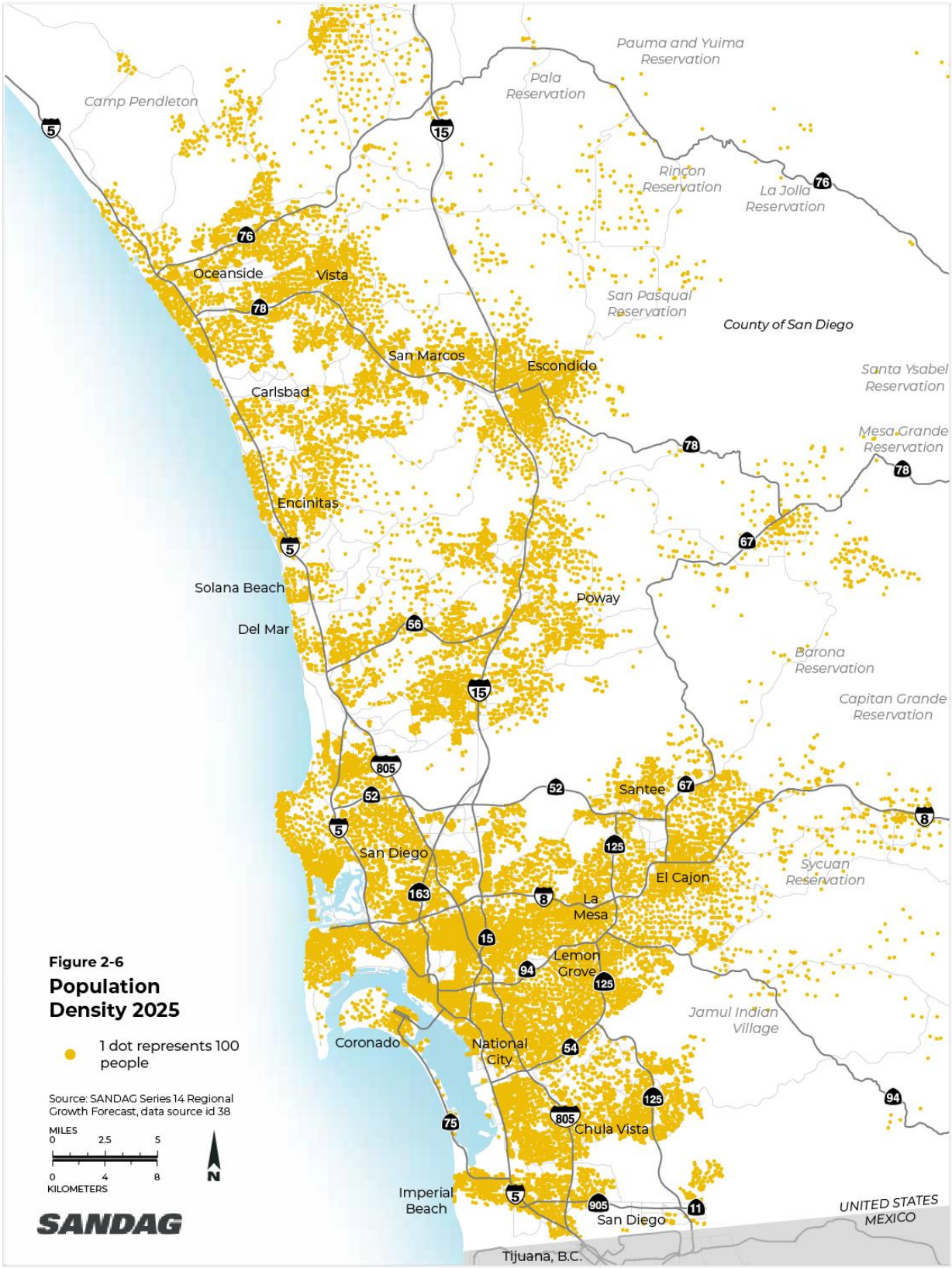
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Figure 2-6
Population Density 2025
1 dot represents 100 people
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
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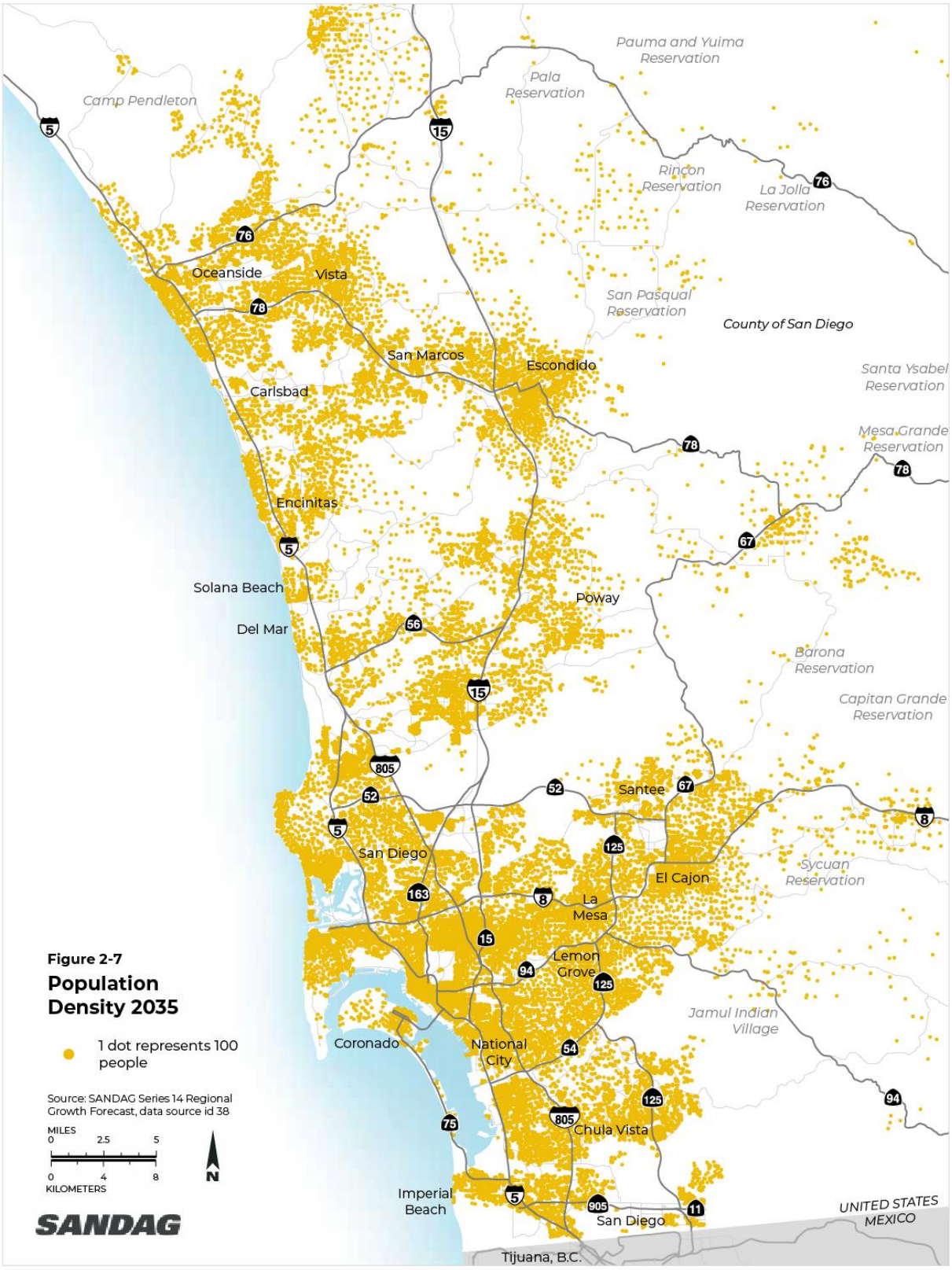
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Figure 2-7
Population Density 2035
1 dot represents 100 people
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
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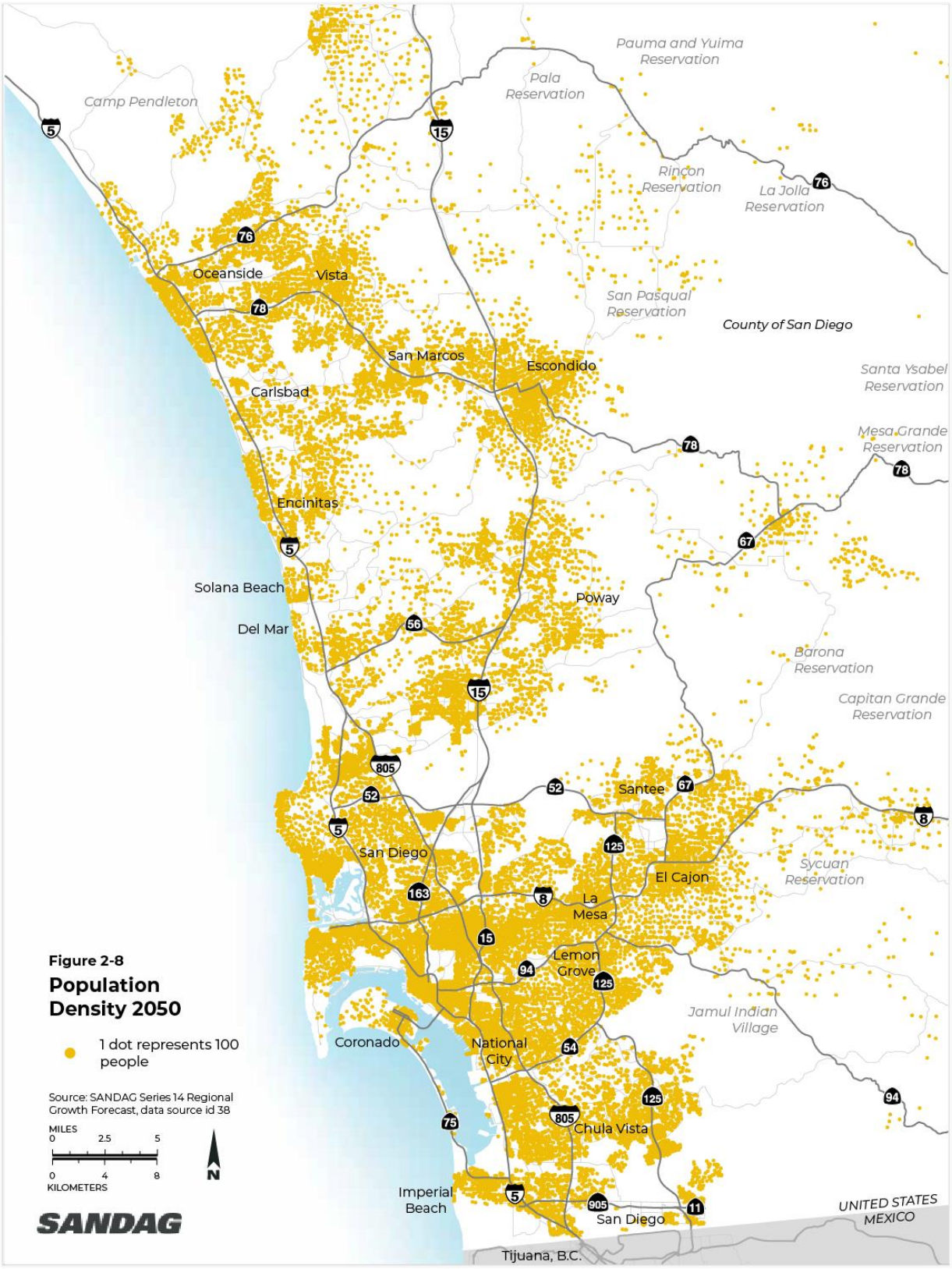
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Figure 2-8
Population Density 2050
1 dot represents 100 people
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
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Housing

From 2016 to 2050, the number of housing units in the region is forecasted to increase by 280,744, from 1,190,555 to 1,471,299, an increase of 24 percent. Table 2-3 and Figures 2-9 through 2-12 show existing housing units in 2016 and forecasted housing units for 2025, 2035, and 2050 for the region and by jurisdiction (the depicted units do not include civilian [e.g., dormitories] or military [e.g., barracks] group quarters).

Table 2-3
Existing and Forecasted Housing Units by Jurisdiction

Jurisdictions	2016	2025	2035	2050	Increase (2016–2050)	
					Housing Units	Percent
Carlsbad	46,152	47,855	51,433	52,727	6,575	14%
Chula Vista	82,794	91,635	95,621	109,474	26,680	32%
Coronado	9,577	9,802	10,486	10,486	909	9%
Del Mar	2,611	2,674	2,778	2,778	167	6%
El Cajon	36,012	37,582	39,830	40,467	4,455	12%
Encinitas	26,040	26,750	27,690	27,690	1,650	6%
Escondido	48,462	54,910	58,990	60,618	12,156	25%
Imperial Beach	9,756	10,212	11,265	11,576	1,820	19%
La Mesa	25,760	28,404	32,282	34,398	8,638	34%
Lemon Grove	9,032	9,476	10,467	10,467	1,435	16%
National City	16,641	17,908	22,410	22,410	5,769	35%
Oceanside	65,851	67,816	71,359	71,359	5,508	8%
Poway	16,606	17,092	18,017	18,017	1,411	8%
San Diego	531,423	592,143	676,236	711,018	179,595	34%
San Marcos	30,539	34,681	34,931	41,016	10,477	34%
Santee	20,525	21,161	21,889	21,969	1,444	7%
Solana Beach	6,497	6,684	7,364	7,364	867	13%
Vista	32,195	33,404	35,317	35,964	3,769	12%
Unincorporated	174,082	178,027	181,501	181,501	7,419	4%
Region	1,190,555	1,288,216	1,409,866	1,471,299	280,744	24%

Source: SANDAG 2021b.

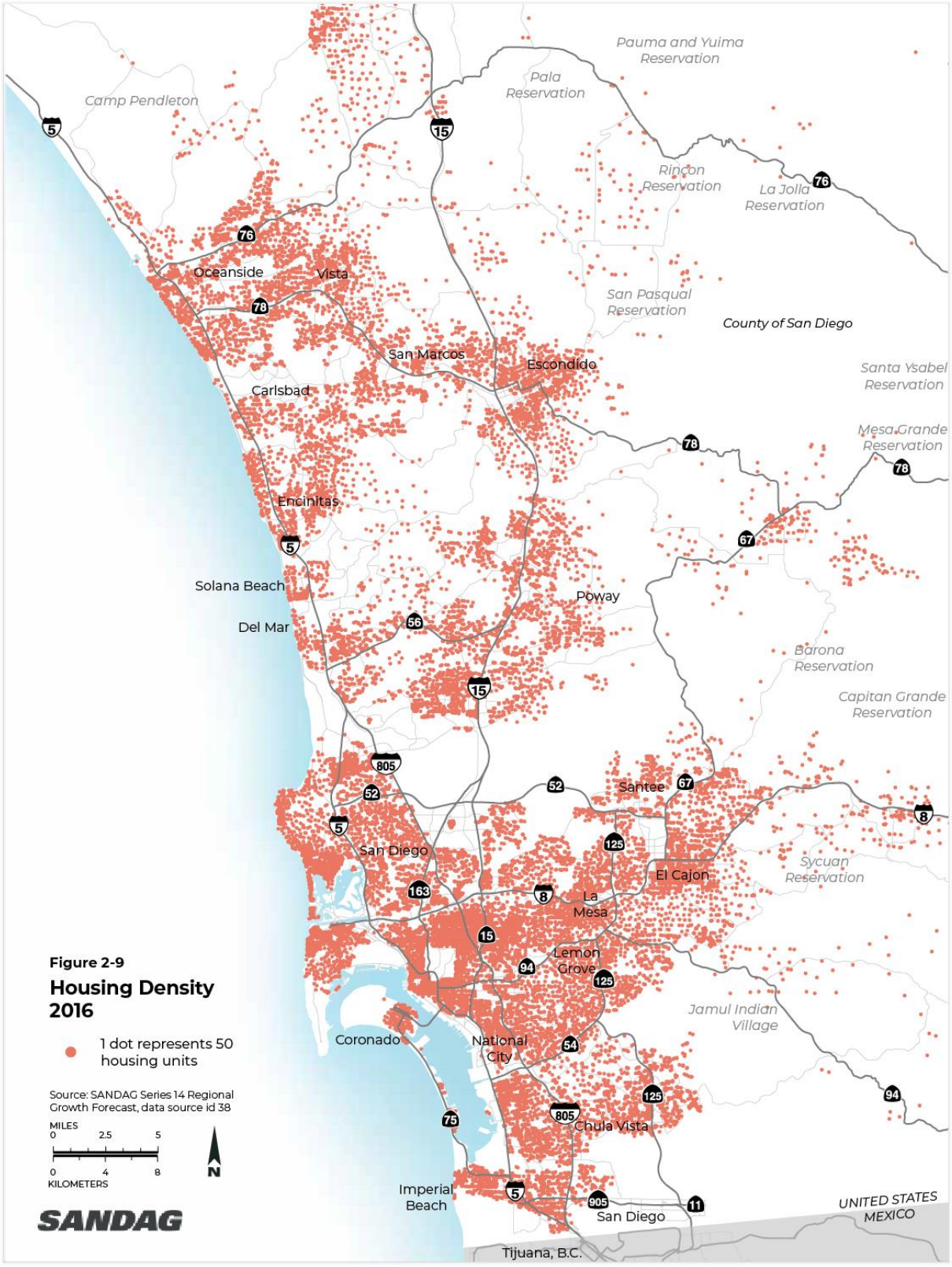
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Figure 2-9
Housing Density 2016
1 dot represents 50 housing units
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
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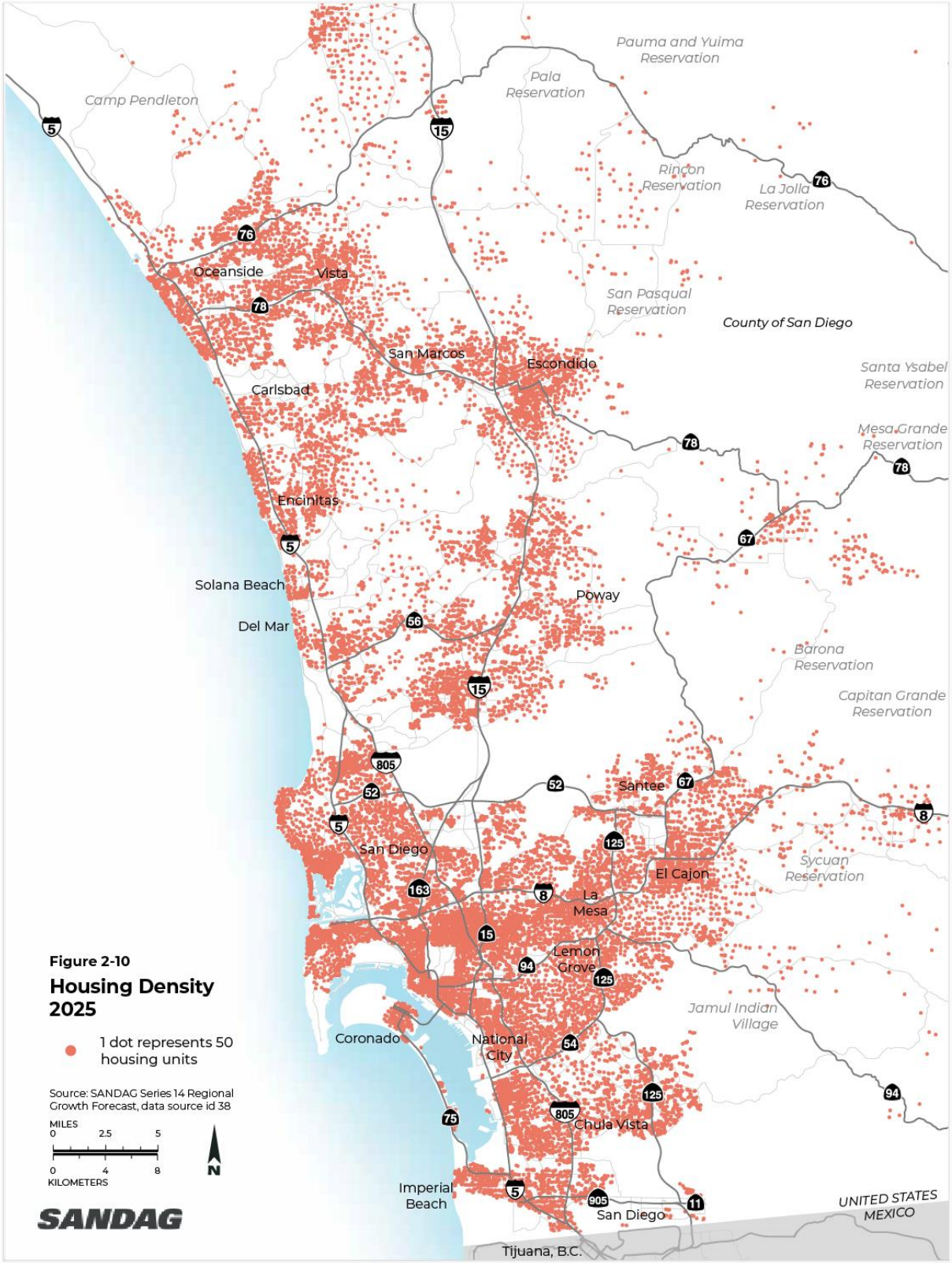
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Figure 2-10
Housing Density 2025
1 dot represents 50 housing units
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
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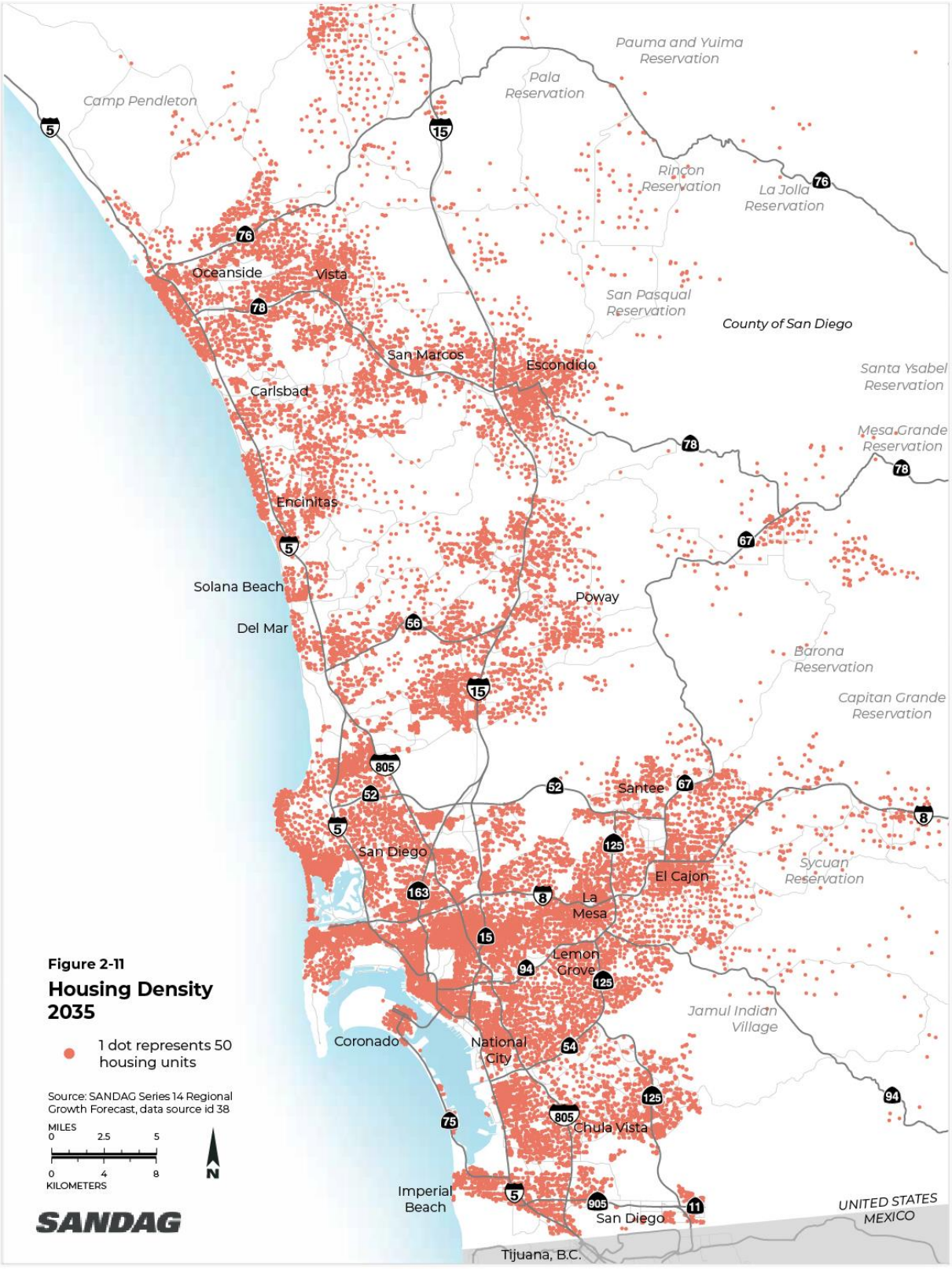
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Figure 2-11
Housing Density 2035
1 dot represents 50 housing units
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
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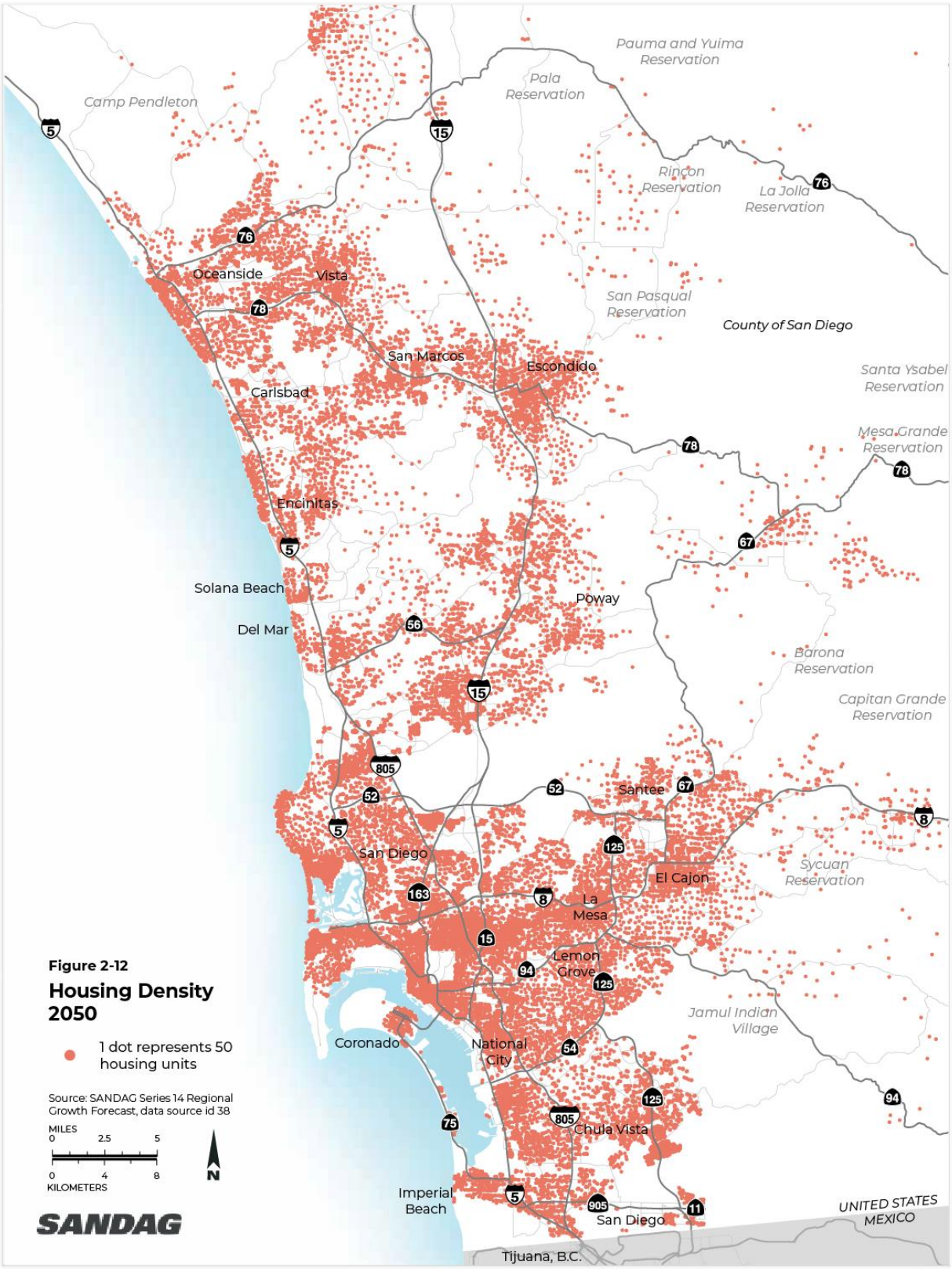
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Figure 2-12
Housing Density 2050
1 dot represents 50 housing units
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
MILES
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KILOMETERS
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SANDAG

Jobs

From 2016 to 2050, the number of jobs in the region is forecasted to increase by 439,899, from 1,646,419 to 2,086,318, an increase of 27 percent. Table 2-4 and Figures 2-13 through 2-16 show existing jobs in 2016 and forecasted jobs for 2025, 2035, and 2050 for the region and by jurisdiction.

Table 2-4
Existing and Forecasted Jobs Growth by Jurisdiction

Jurisdictions	2016	2025	2035	2050	Increase (2016–2050)	
					Jobs	Percent
Carlsbad	76,617	83,955	90,701	97,507	20,890	27%
Chula Vista	74,078	83,027	98,701	116,185	42,107	57%
Coronado	26,888	27,283	27,978	28,771	1,883	7%
Del Mar	4,476	4,494	4,536	4,586	110	2%
El Cajon	48,408	52,526	59,516	67,135	18,727	39%
Encinitas	28,812	29,264	29,950	30,753	1,941	7%
Escondido	58,323	60,758	64,686	68,924	10,601	18%
Imperial Beach	5,621	5,948	6,407	6,946	1,325	24%
La Mesa	30,188	31,647	34,145	36,729	6,541	22%
Lemon Grove	9,099	9,368	9,846	10,335	1,236	14%
National City	42,218	54,193	57,419	60,875	18,657	44%
Oceanside	47,256	48,317	49,909	50,756	3,500	7%
Poway	35,297	35,508	35,865	36,216	919	3%
San Diego	892,828	953,977	1,046,814	1,140,676	247,848	28%
San Marcos	41,527	47,021	54,548	62,306	20,779	50%
Santee	18,499	18,829	19,494	20,100	1,601	9%
Solana Beach	10,064	10,277	10,648	11,027	963	10%
Vista	44,105	45,253	47,133	49,115	5,010	11%
Unincorporated	152,115	160,102	173,179	187,376	35,261	23%
Region	1,646,419	1,761,747	1,921,475	2,086,318	439,899	27%

Source: SANDAG 2021b

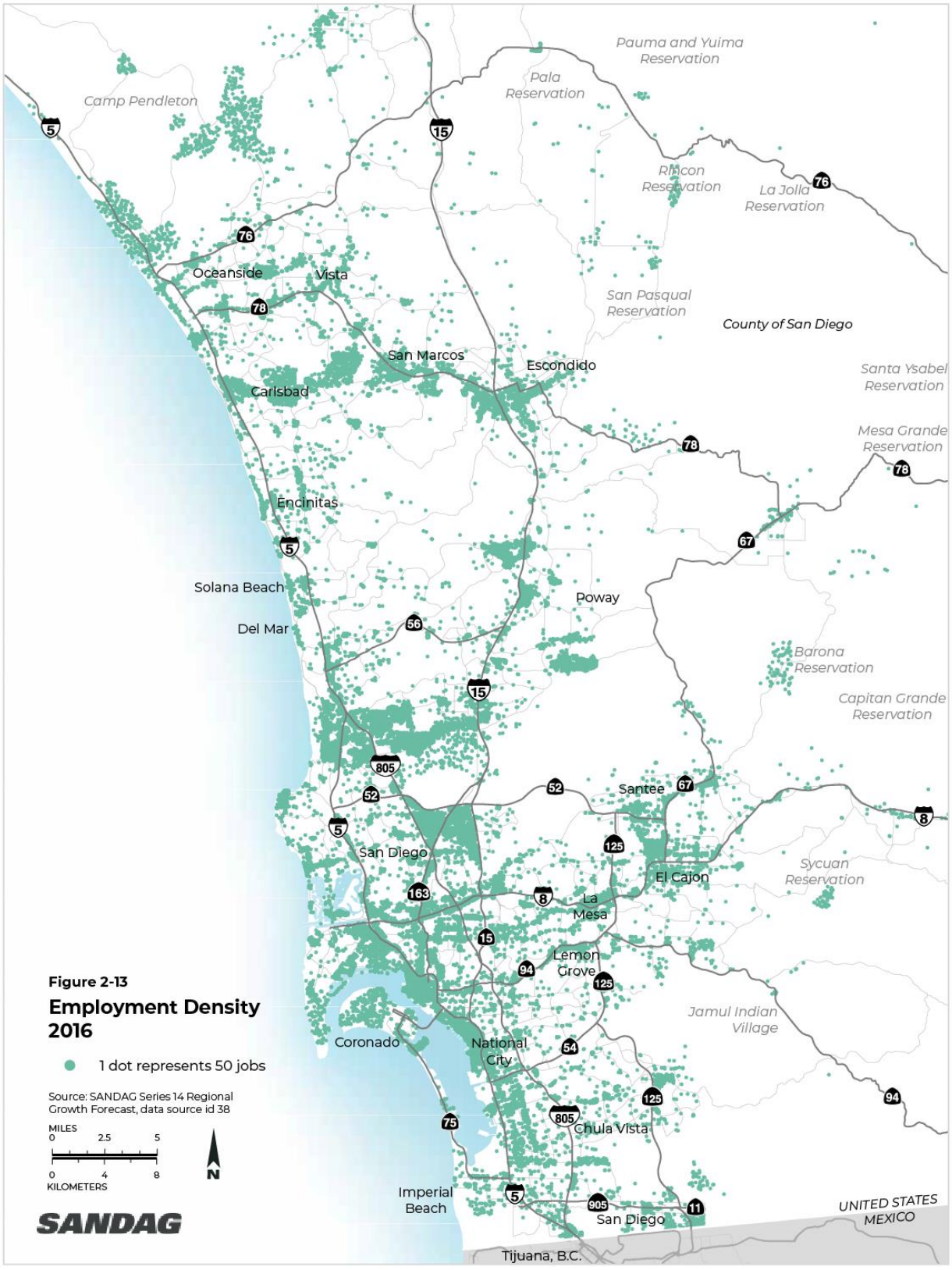
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Figure 2-13
Employment Density 2016
1 dot represents 50 jobs
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
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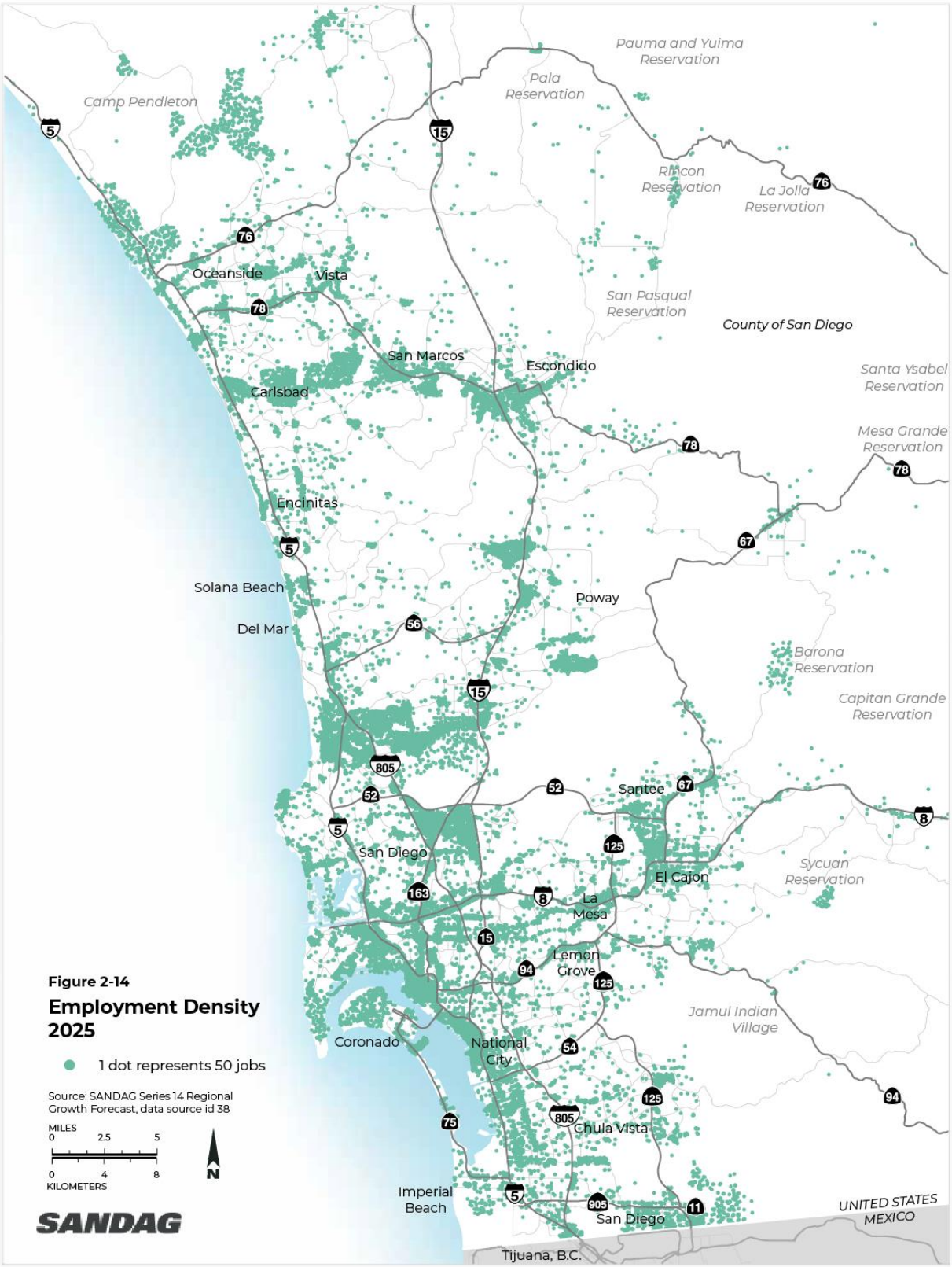
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Figure 2-14
Employment Density 2025
1 dot represents 50 jobs
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
MILES
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0 4 8
KILOMETERS
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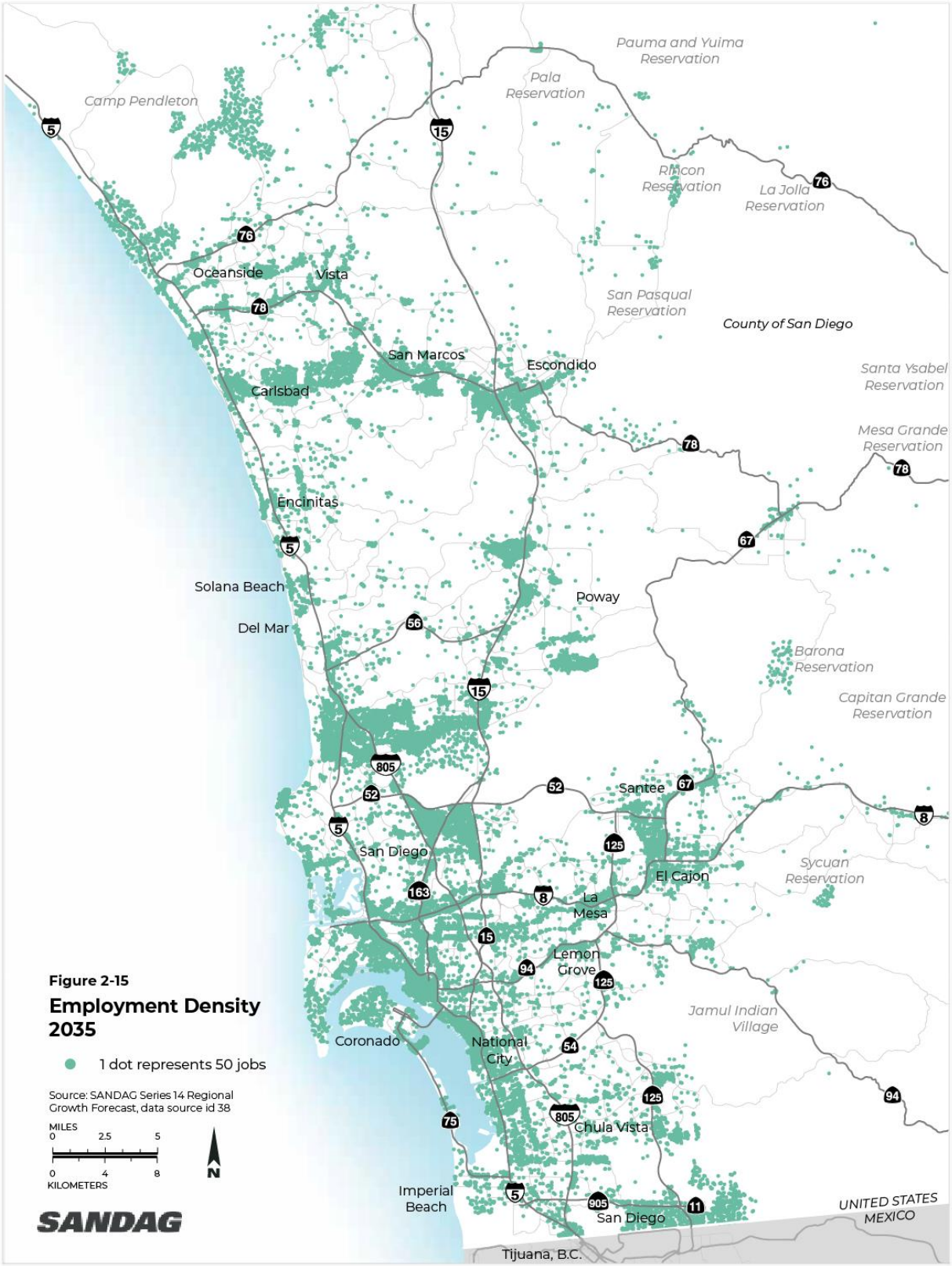
SANDAG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Jamul Indian Village
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National City
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UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-15
Employment Density 2035
1 dot represents 50 jobs
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
MILES
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0 4 8
KILOMETERS
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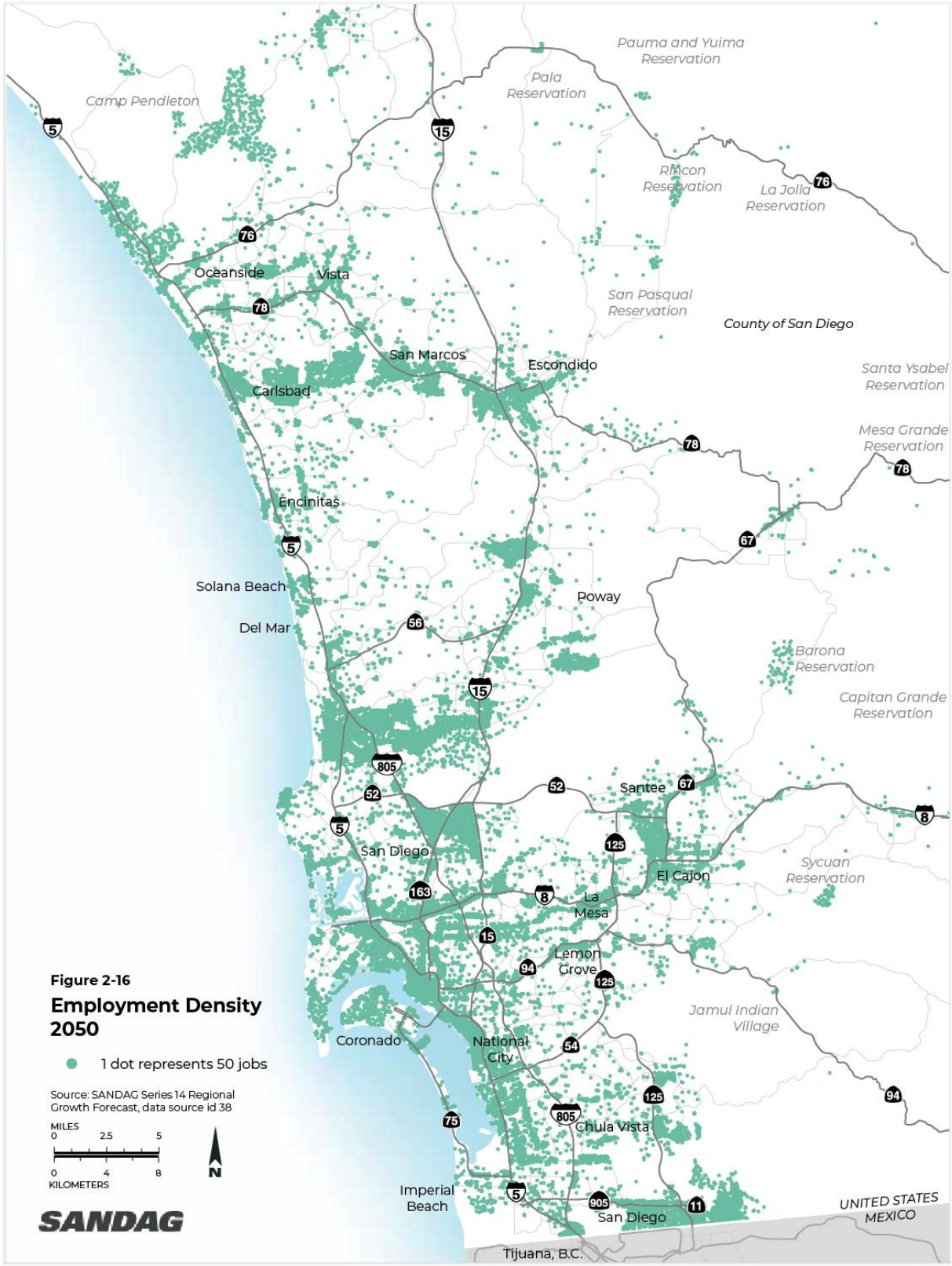
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Sycuan Reservation
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Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-16
Employment Density 2050
1 dot represents 50 jobs
Source: SANDAG Series 14 Regional Growth Forecast, data source id 38
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG

SUMMARY OF REGIONAL GROWTH AND LAND USE CHANGE BY PHASE

By 2025

From 2016 to 2025, regional population is forecasted to increase by 161,338 people (5 percent), adding 97,661 housing units (8 percent) and 115,328 jobs (7 percent). The 2025 regional land use pattern is shown on Figure 2-17. Approximately 79 percent of the forecasted regional population increase by 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent). Those same three jurisdictions accommodate approximately 78 percent of new housing units in the region by 2025, while the City of San Diego, National City, and the City of Chula Vista accommodate more than 70 percent of new jobs in the region by 2025.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are Downtown, Mission Valley, Midway-Pacific Highway, and University Center. The highest proportions of forecasted job increases are in the communities of Downtown, University Center, Otay Mesa, and Kearny Mesa.

In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases are Otay and North County Metro. The only significant increases in jobs over that period are in Otay.

By 2035

From 2025 to 2035, regional population is forecasted to increase by 149,500 people (4 percent), adding 121,650 housing units (9 percent) and 159,728 jobs (9 percent). The 2035 regional land use pattern is shown on Figure 2-18.

Approximately 80 percent of the forecasted regional population increase between 2025 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent). Similarly, these three jurisdictions accommodate approximately 76 percent of new housing units and 70 percent of new jobs, respectively, between 2025 and 2035.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are Downtown, Mission Valley, Kearny Mesa, and Midway Pacific Highway. The highest proportions of forecasted job increases are in the communities of Downtown, Kearny Mesa, University, and Otay Mesa.

In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases are Lakeside, North County Metro and Otay. The only significant increase in jobs over that period is in Otay.

By 2050

From 2035 to 2050, regional population is forecasted to increase by 125,725 people (3 percent), adding 61,433 housing units (4 percent) and 164,843 jobs (8 percent). The 2050 regional land use pattern is shown on Figure 2-19.

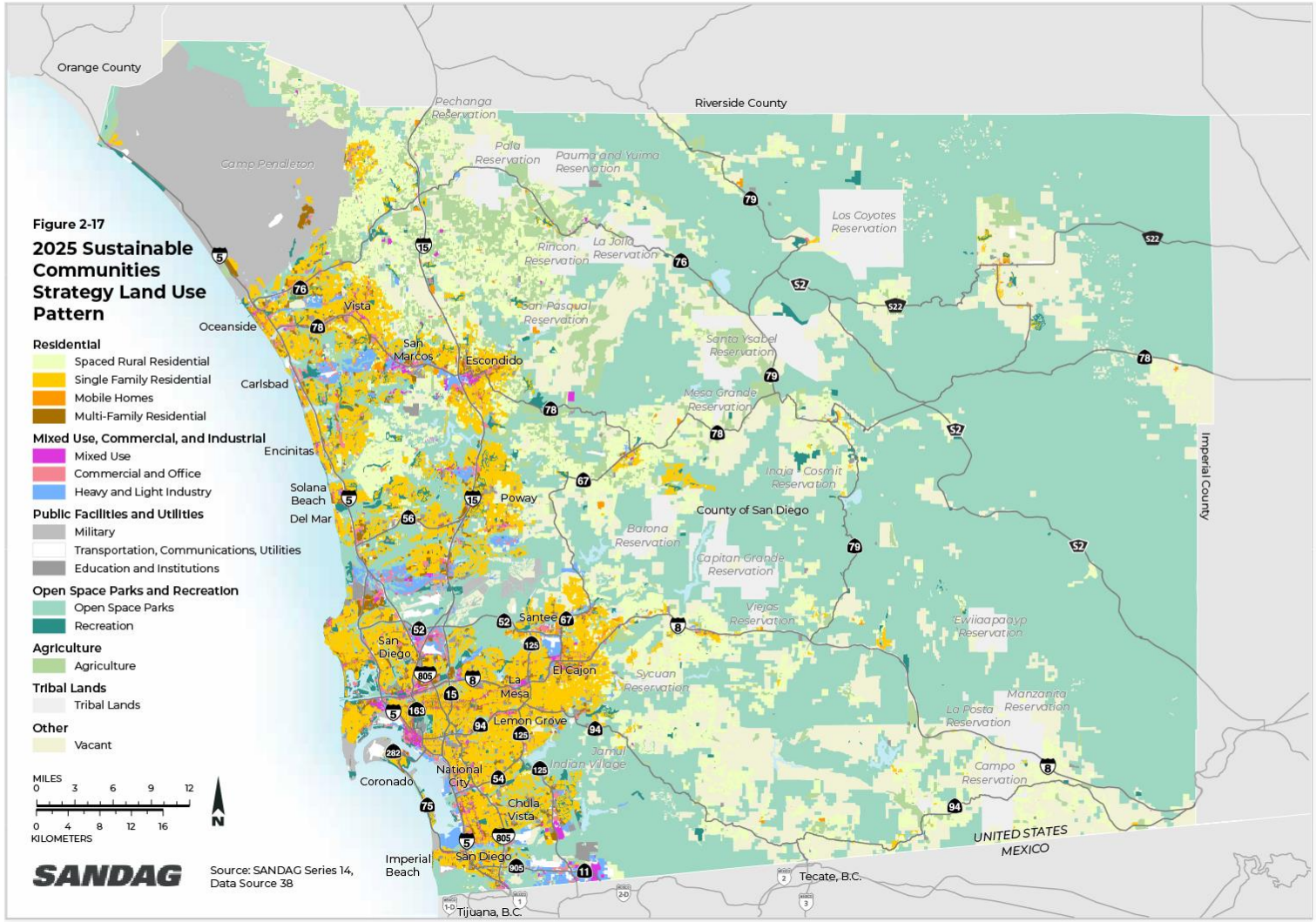
Figure 2-17
2025 Sustainable Communities Strategy Land Use Pattern
Residential
Spaced Rural Residential
Single Family Residential
Mobile Homes
Multi-Family Residential
Mixed Use, Commercial, and Industrial
Mixed Use
Commercial and Office
Heavy and Light Industry
Public Facilities and Utilities
Military
Transportation, Communications, Utilities
Education and Institutions
Open Space Parks and Recreation
Open Space Parks
Recreation
Agriculture
Agriculture
Tribal Lands
Tribal Lands
Other
Vacant
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Source: SANDAG Series 14, Data Source 38
Orange County
Riverside County
Imperial County
County of San Diego
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
San Pasqual Reservation
Santa Ysabel Reservation
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Inaja Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
El Cajon
La Mesa
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Imperial Beach
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Tecate, B.C.
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MEXICO

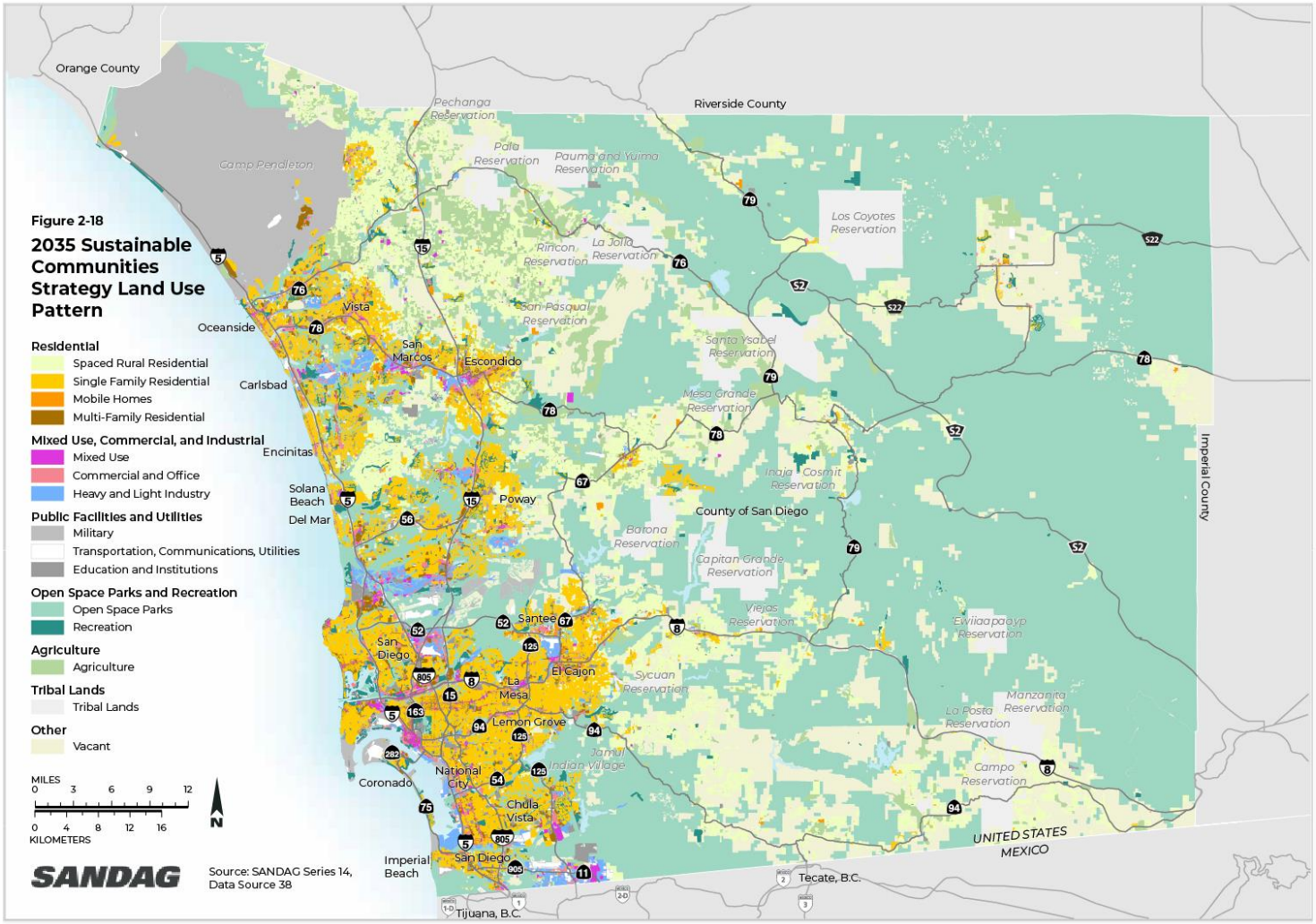
Figure 2-18
2035 Sustainable Communities Strategy Land Use Pattern
Residential
Spaced Rural Residential
Single Family Residential
Mobile Homes
Multi-Family Residential
Mixed Use, Commercial, and Industrial
Mixed Use
Commercial and Office
Heavy and Light Industry
Public Facilities and Utilities
Military
Transportation, Communications, Utilities
Education and Institutions
Open Space Parks and Recreation
Open Space Parks
Recreation
Agriculture
Agriculture
Tribal Lands
Tribal Lands
Other
Vacant
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Source: SANDAG Series 14, Data Source 38
Orange County
Riverside County
Imperial County
County of San Diego
Camp Pendleton
Pechanga Reservation
Pala Reservation
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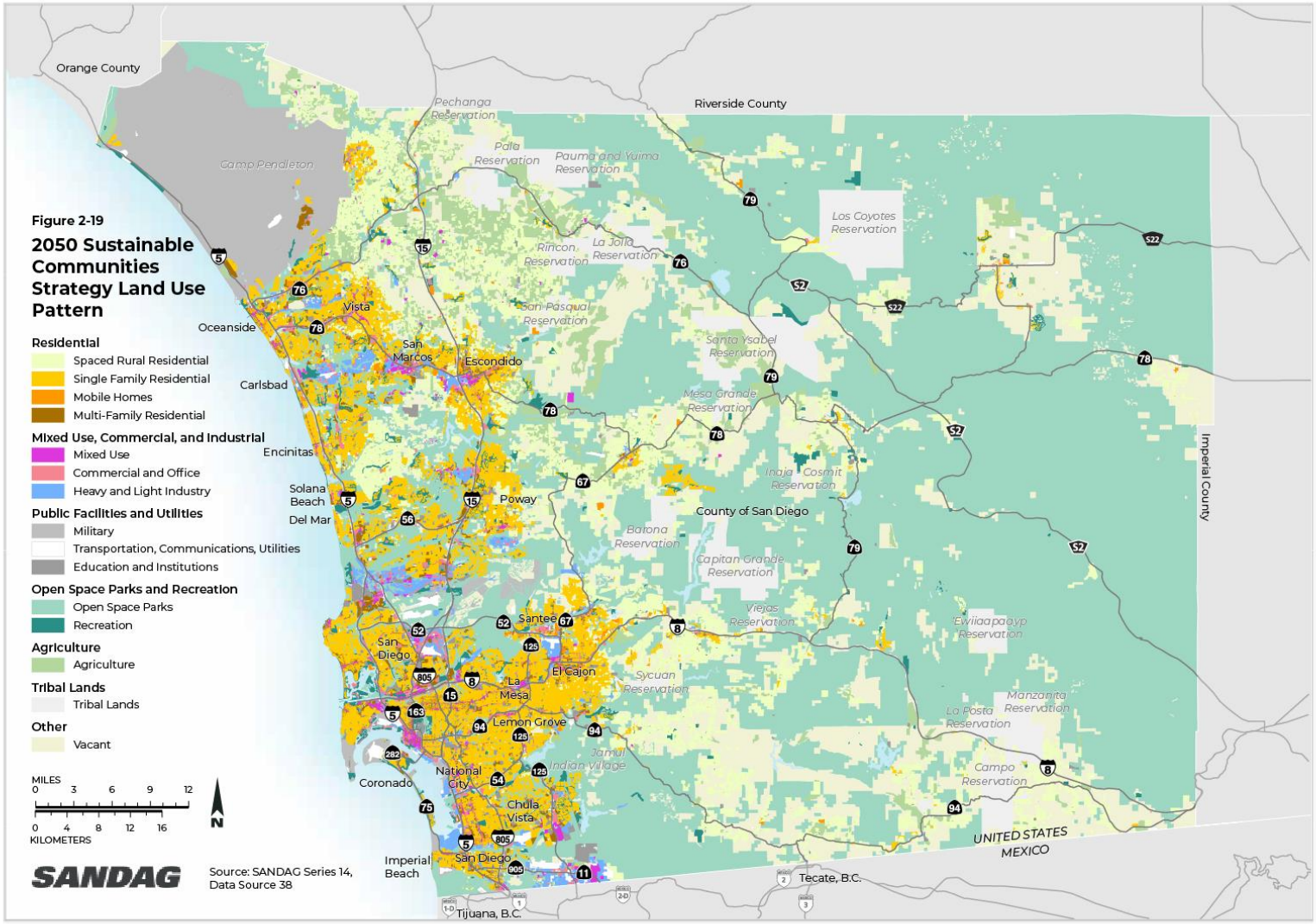
Figure 2-19
2050 Sustainable Communities Strategy Land Use Pattern
Residential
Spaced Rural Residential
Single Family Residential
Mobile Homes
Multi-Family Residential
Mixed Use, Commercial, and Industrial
Mixed Use
Commercial and Office
Heavy and Light Industry
Public Facilities and Utilities
Military
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Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), San Marcos (13 percent), and City of Chula Vista (28 percent). Similarly, these three jurisdictions accommodate approximately 89 percent of new housing units and 72 percent of new jobs, respectively, between 2036 and 2050.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are the Downtown, Midway Pacific Highway, and Uptown. The highest proportions of forecasted job increases are in the communities of Downtown, Otay Mesa, Kearny Mesa, and University City.

In the unincorporated County, the communities with the highest proportion of the forecasted population increases are Lakeside, North County Metro, and Valle de Oro. There are no housing units built in the Unincorporated area after 2035. The only significant increase in jobs over that period is in Otay.

2.2.3 SB 375 SUSTAINABLE COMMUNITIES STRATEGY

SUSTAINABLE COMMUNITIES STRATEGY LAND USE PATTERN

SB 375 requires the SCS to include a pattern for forecasted growth and development that accomplishes the following:

- Achieves the regional GHG reduction targets when combined with the transportation network.
- Accommodates the RHNA Determination.
- Utilizes the most recent planning assumptions.

As such, the forecasted development pattern for the SCS is driven by regional goals for sustainability, mobility, housing affordability, and economic prosperity. The SCS land use pattern uses Mobility Hubs to concentrate future development. Mobility Hubs are incentivized land uses and transportation infrastructure that maximize the connectivity of the transportation system set out in the proposed Plan. Mobility Hubs are proposed for communities with a high concentration of people, destinations, and travel choices where densification is envisioned in the SCS, subject to approval of local jurisdictions. Mobility Hubs are unique to each community and reflect respective community transportation needs. They offer on-demand travel options and supporting infrastructure that enhance connections to high-quality Transit Leap services while helping people make short trips to local destinations around their community on Flexible Fleets. Mobility Hubs can span one, two, or a few miles based on community characteristics.

In the SCS land use pattern, forecasted housing unit and job growth are within these areas of the region, which overlap with areas identified by local jurisdictions for increased density such as Smart Growth Opportunity Areas and transit priority areas. Additionally, the SCS land use pattern identifies areas within the region sufficient to house the 6th Cycle RHNA Plan allocations. The adopted 6th cycle RHNA Plan[2] for the San Diego region, which is a component of the proposed Plan's SCS, covers the 8-year period from 2021 through 2029. The RHNA allocates housing need in four income categories for each of the cities and San Diego County to use in their housing elements. The cities and County are required to update their housing elements to include RHNA

[2] On July 21, 2020, HCD approved SANDAG's adopted 6th Cycle RHNA Plan, upon finding it consistent with HCD's July 5, 2018, RHNA Determination of 171,685 housing unit need.

allocations every 8 years; updates can be required every 4 years if updated housing elements are not adopted by certain timelines.

More information about the SCS land use pattern can be found in Chapter 2 of the proposed Plan as well as Appendices~~x~~ D and F to the proposed Plan.

GENERAL INTENSIFICATION OF LAND USES

The SCS land use pattern represents a continuing trend in the San Diego region to provide more housing and job opportunities in the existing urbanized areas of the region. In 2012, SANDAG projected 17 percent of future housing growth would occur in the unincorporated area of the county under local general plans at the time. Today, SANDAG expects 12 percent of growth to occur in the unincorporated areas, much of that focused in the Lakeside, Spring Valley, and North County Metro. Tables 2-2 through 2-4 above show the forecasted growth in population, jobs, and housing units for each jurisdiction from the SCS land use pattern.

In terms of growth in total jobs over the forecasted time period, SANDAG expects the majority of job growth to occur in the City of San Diego. The community planning areas in the City of San Diego that show the highest growth in jobs are Downtown, Kearny Mesa, and Otay Mesa. However, in terms of percent growth, Chula Vista and San Marcos are forecasted to grow by 50 percent or more. Tables 2-1 through 2-3 present base year and forecasted population, employment, and housing data for the 19 local jurisdictions, respectively.

As discussed above, the SCS land use pattern concentrates development into either Mobility Hub or Smart Growth Opportunity Areas.[3] Tables 2-5 through 2-7 show the growth in Mobility Hubs of population, jobs, and housing units over the forecasted timeline. Table 2-5 shows that in 2016, less than half of the region's population live in Mobility Hub areas, but by 2050 more than half do. The pattern is similar with housing units, as seen in Table 2-7. The concentration of jobs in Mobility Hubs can be seen in 2016, and this trend continues through the end of the forecast. Figures 2-20 through 2-22 show the 2025, 2035, and 2050 housing and employment density, respectively, with the Mobility Hubs.

Table 2-5
Total Population by Mobility Hub

Mobility Hub Name	2016	2025	2035	2050
Mobility Hub Total	1,453,913	1,657,130	1,875,367	1,988,009
Coastal	172,824	178,181	190,284	197,683
Gateway	318,246	353,777	390,145	395,748
Major Employment Center	253,054	315,300	396,722	430,929
Suburban	392,726	433,156	455,086	487,082
Urban	317,063	376,716	443,130	476,567
Outside of Mobility Hub Network	1,855,597	1,813,718	1,744,981	1,758,064
Regional Total	3,309,510	3,470,848	3,620,348	3,746,073

Source: SANDAG 2021b.

[3] In-progress scheduled development or "pipeline" projects were also included in the SCS land use pattern and may be outside of the Mobility Hub or Smart Growth Opportunity Area boundaries.

Table 2-6
Total Jobs by Mobility Hub

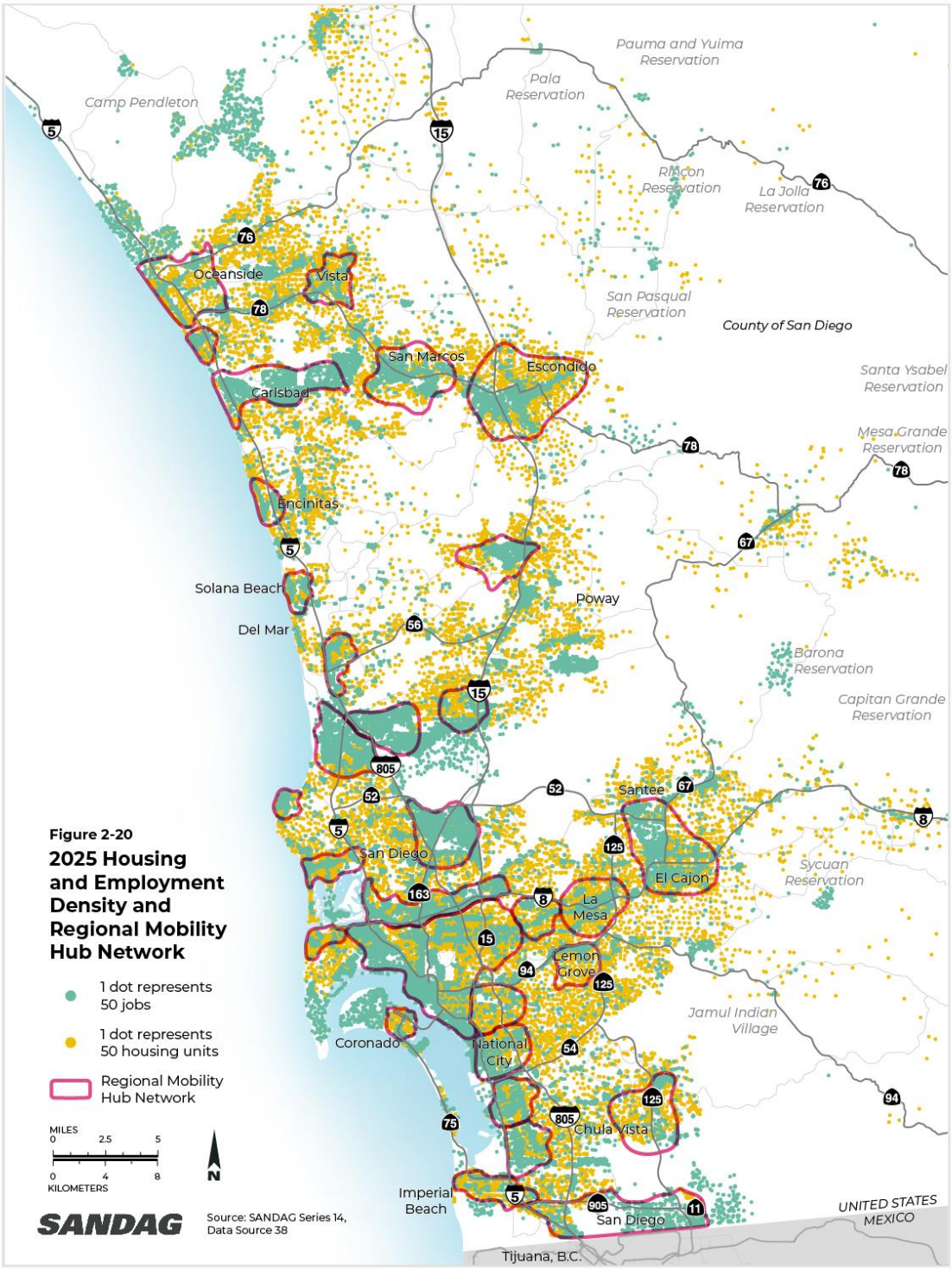
Mobility Hub Name	2016	2025	2035	2050
Mobility Hub Total	1,113,109	1,213,064	1,347,193	1,484,038
Coastal	78,247	79,873	82,603	85,544
Gateway	153,855	168,685	193,254	218,401
Major Employment Center	491,342	533,327	594,637	655,856
Suburban	164,146	175,202	192,714	211,651
Urban	225,519	255,977	283,985	312,586
Outside of Mobility Hub Network	533,310	548,683	574,282	602,280
Regional Total	1,646,419	1,761,747	1,921,475	2,086,318

Source: SANDAG 2021b.

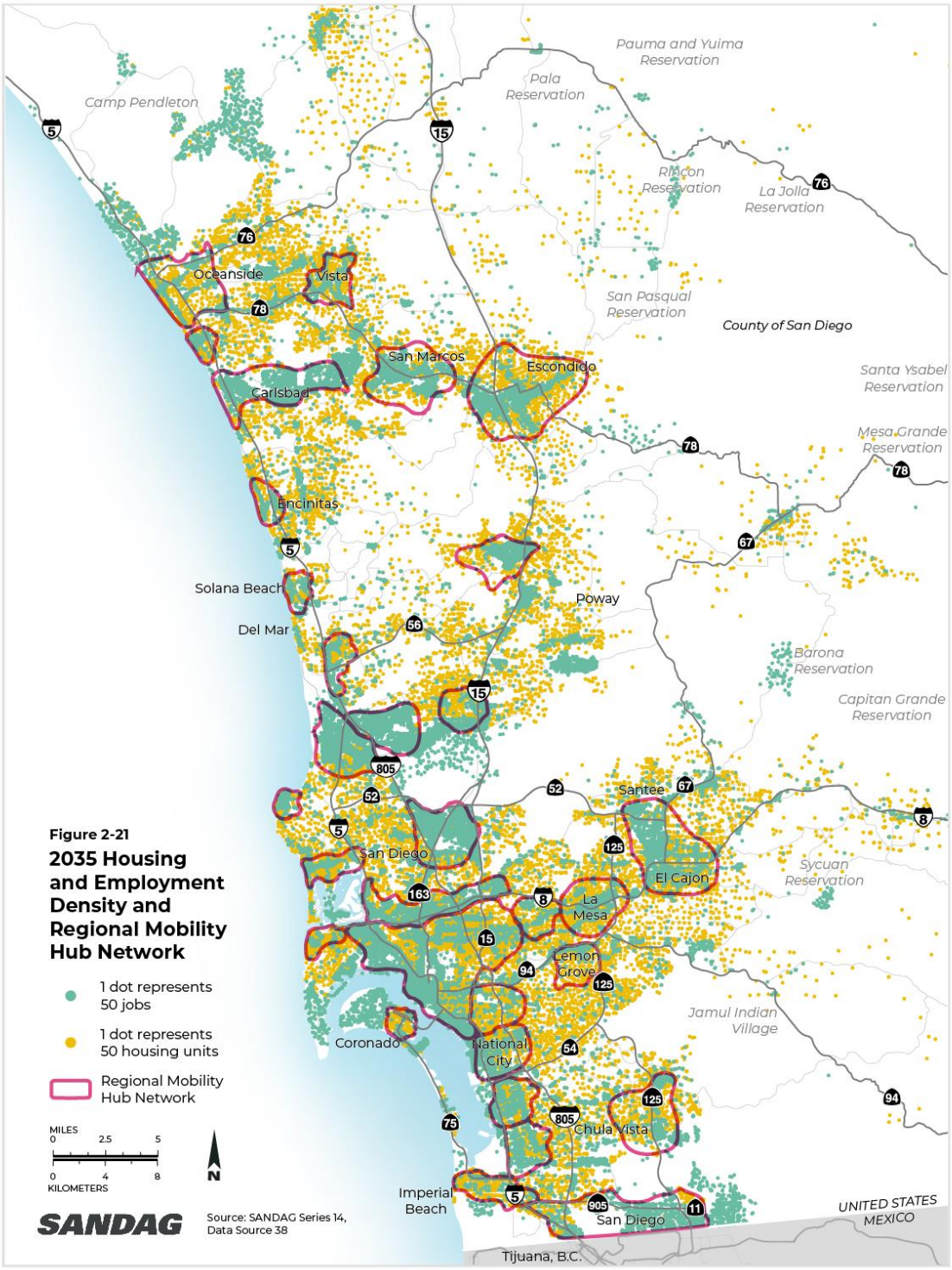
Table 2-7
Total Housing Units by Mobility Hub

Mobility Hub Name	2016	2025	2035	2050
Mobility Hub Total	533,521	624,884	743,711	801,537
Coastal	75,078	77,962	87,665	90,392
Gateway	106,569	121,999	138,813	142,289
Major Employment Center	89,685	114,623	153,360	170,879
Suburban	132,231	152,789	168,617	185,473
Urban	129,958	157,511	195,256	212,504
Outside of Mobility Hub Network	657,034	663,332	666,155	669,762
Regional Total	1,190,555	1,288,216	1,409,866	1,471,299

Source: SANDAG 2021b.



These maps show generalized regional Mobility Hub boundaries for planning purposes and are not intended to be binding or precise. Mobility Hub boundaries are subject to refinement in close coordination with the affected jurisdiction(s).



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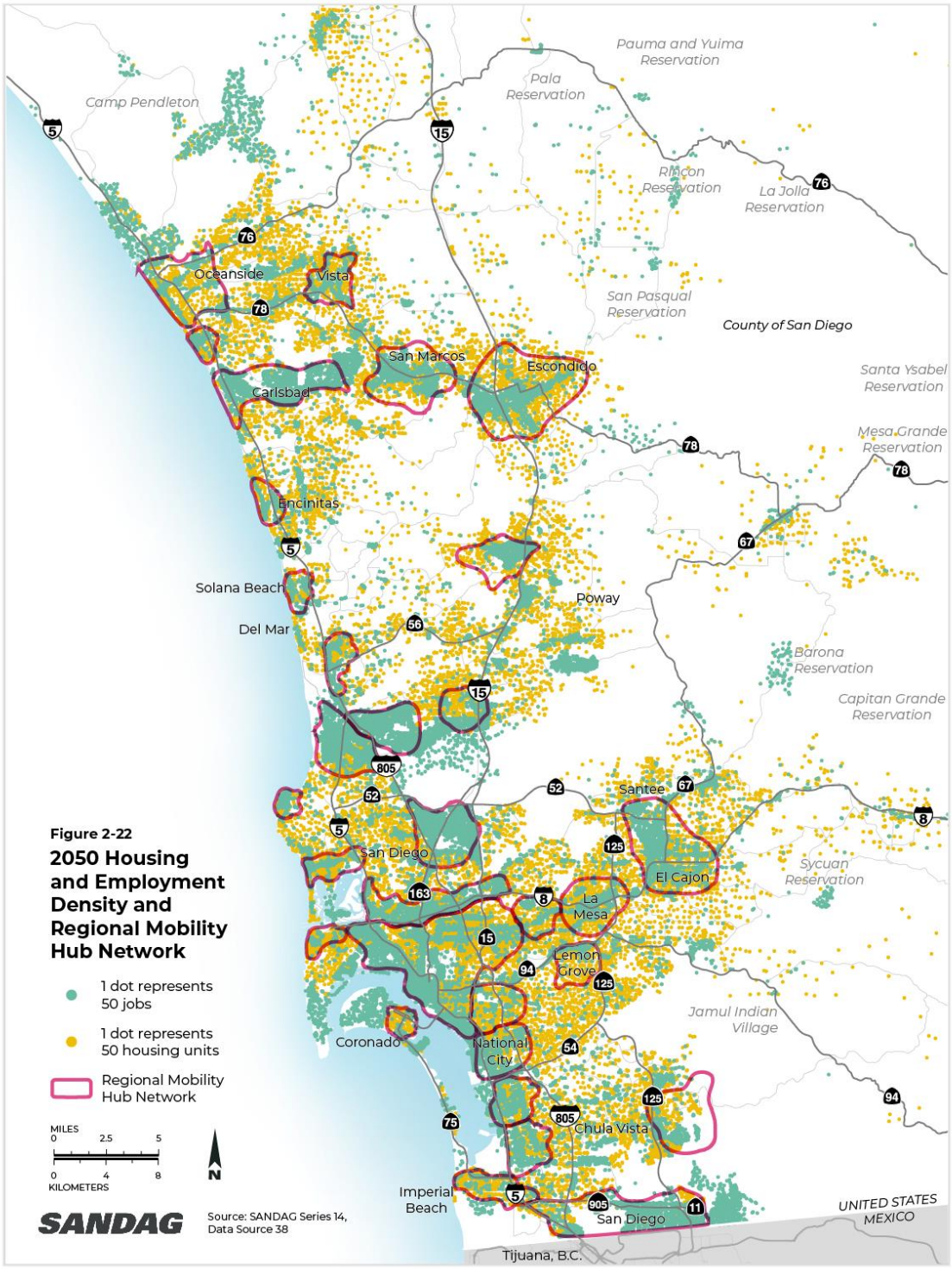


These maps show generalized regional Mobility Hub boundaries for planning purposes and are not intended to be binding or precise. Mobility Hub boundaries are subject to refinement in close coordination with the affected jurisdiction(s).

2.2.4 GHG REDUCTION TARGETS

In accordance with SB 375, the proposed Plan must include an SCS that demonstrates that the San Diego region will reduce GHG emissions (GHG emissions for SB 375 compliance are calculated using carbon dioxide [CO_2] emissions) from automobiles and light-duty trucks to achieve, if there is a feasible way to do so, the GHG emission reduction targets approved by CARB. Targets are expressed as percent change in per capita GHG emissions relative to 2005. Consistent with the targets established by CARB, the targets for the San Diego region are a 15 percent per capita reduction in passenger vehicle GHG emissions by 2020 and a 19 percent per capita reduction by 2035. The proposed Plan would exceed the GHG emission reduction targets for 2020 and 2035 established by CARB, as shown in Table 2-8. While CARB does not set targets beyond 2035, SANDAG has provided data in Section 4.8, *Greenhouse Gas Emissions*, of this EIR utilizing the same methodology to show continued GHG emission reductions beyond 2035.

Table 2-8
Proposed Plan Estimated SB 375 Greenhouse Gas Emissions Reductions for Cars and Light Trucks

Target Year	CARB Target	Proposed Plan
2020	15%	17%
2035	19%	20%

Source: Appendix D of the proposed Plan (SANDAG 2021c).

2.3 CONTENT AND ORGANIZATION OF THE PROPOSED PLAN

The proposed Plan consists of three chapters and a series of appendices with supporting information. The major contents of each chapter are summarized below.

- **Chapter 1: A Bold New Vision for the 2021 Regional Plan**

  Describes our region's challenges, discusses anticipated growth in the San Diego region, and outlines the proposed Plan's Vision and Goals.

- **Chapter 2: Sustainable Communities Strategy – A Framework for the Future**

  Describes the proposed Plan SCS—the package of projects, policies, land use strategies, and programs ~~and~~ that will achieve the Vision and Goals.

- **Chapter 3: Paying for the Regional Plan, Forming Partnerships and Taking Action, and Monitoring How the Proposed Plan Performs**

  Describes the planning, investments, actions, and partnerships needed to implement the ~~2021~~ proposed Plan, and the metrics that will be used to monitor implementation and performance over time.

2.4 EIR PROJECT OBJECTIVES

The underlying purpose of the project is to develop a Regional Plan that meets federal and State planning requirements, and to address the many regional transportation challenges that are deeply connected to larger societal issues that impact everyone's quality of life, including economic and social inequities, climate change, public health, and safety. To address the many challenges that confront the region, for both the population of today and the population of the future, a new vision is needed for the transportation system that is built to increase individual opportunities and choices for getting around. This expanded system should integrate land

use planning and transportation improvements and use technology to offer more options for travel and increase safety. The outcome would be greater mobility and transportation connectivity, and a shift away from overloading our roadways with cars, even as our regional population continues to expand.

Given this purpose, SANDAG developed the following project objectives for this EIR:

1. Focus population and employment growth in mobility hubs and existing urban areas to protect sensitive habitat and natural resource areas.
2. Provide transportation investments that support compact land development patterns and reduce sprawl.
3. Meet greenhouse gas emissions targets established for the San Diego region by the California Air Resources Board and the SANDAG Board of Directors.
4. Provide transportation investments and land use patterns that promote social equity.
5. Provide transportation investments and land use patterns that reduce vehicle miles traveled and improve air quality.
6. Provide multi-modal access to employment centers and key destinations for all communities.
7. Enhance the efficiency of the transportation network for moving people and goods through the deployment of new technologies.

2.5 PROJECT CHARACTERISTICS

The proposed Plan includes the SCS described in Section 2.2.3, *SB 375 Sustainable Communities Strategy,* as well as the 5 Big Moves, transportation network improvements, and supporting policies and programs described in this section.

The proposed Plan creates an integrated transportation system throughout the 11 Major Travel Corridors and the Rural Corridors of the San Diego region. The system components in each Major Travel Corridor consist of transportation improvements under each of the 5 Big Moves, enhanced Airport Connectivity, improved Border/Ports of Entry, and Supporting Policies and Programs. Each of these components is described in greater detail below.

2.5.1 THE 5 BIG MOVES

COMPLETE CORRIDORS

Complete Corridors provide dedicated, safe spaces for everyone, including freight vehicles as well as people who walk, bike, drive, ride transit, and use Flexible Fleets. Key features and benefits of Complete Corridors include Managed Lanes (ML) that offer priority access to transit, carpool, and vanpool users, and access to single-occupant drivers for a fee; Active Transportation and Demand Management (ATDM) technology that enables transportation operators to modify how infrastructure and services are used based on changing traffic conditions; high-speed communication networks that allow connected vehicles, smartphones, and smart roads to share data to reduce collisions, increase network capacity, and improve travel times; priority access to roadways for public transit, active transportation, and shared mobility services; managed curb space that accommodates different uses based on levels of traffic at varying times of the day; and electric vehicle (EV) infrastructure, including public charging and hydrogen fueling stations.

As shown in Table 2-9, each Complete Corridor type is composed of specific multimodal elements designed to serve four distinct trip needs and interface with Transit Leap, Mobility Hubs, and Flexible Fleets. Modal maps of the Complete Corridors in the proposed Plan for years 2025, 2035, and 2050 are shown on Figures 2-23 through 2-25. Managed Lanes (MLs) and Freeway (F) lanes are included in the figures to indicate the number of those lanes included in the total configuration of that phase. For example, a freeway segment labeled "8F+2ML" would represent eight Freeway lanes plus two Managed Lanes on that segment.

Table 2-9
Complete Corridors

Type	Travel Shed/Trip Purpose/Characteristics	Functionality/ Multimodal Elements	Key Performance Characteristics
Regional and Interregional	Regional and Interregional commuting Serves long distance commute trips (>20 miles), regional employment and industrial centers and primary regional freight backbone	High-speed transit, regional freight, active transportation	About 65–70% of freeway vehicle miles traveled (VMT) (total for all type A) 60% of trips >20 miles 66% of total regional freeway Delay
Urban Connectivity	Regional urban commuting Serves long and medium distance commute trips (>5 miles), part of primary regional freight backbone	Transit, regional freight, and active transportation	25–30 % of total freeway VMT 80–90% of trips >5 miles 35% of regional freeway delay
Rural Access and Connectivity	Provide rural access and connectivity: non commuting long stretches of rural roadway connecting nearby rural towns and lands to the interstate system Serves long and medium distance trips (>5 miles) with mountainous terrain and limited transit option	Transit: Rural bus, commuter bus, local bus International/Cross Border/subregional freight Active Transportation	About 5% of regional freeway VMT 80% of trips lengths 5–20 miles About 1% of regional freeway delay
CC Regional Arterial Network	Local commuting: primary arterial network connecting employment and industrial centers to residential neighborhoods Trip distance 5–20 miles with bus and light rail providing transit backbone	Transit: Light Rail Transit (LRT)/Bus Rapid Transit (BRT)/*Rapid* bus/Express bus Short haul trips (local delivery) Active transportation: urban network, first and last mile to Mobility Hubs	Generally represents 65% of trips <5 miles

Complete Corridors integrates multiple transportation components: Managed Lanes, Connectors and Managed Lane Connector, ATDM and Smart Intersection Systems (SIS), Active Transportation, Rural Corridors, Arterial Projects, and Goods Movement. Each of these components is discussed in greater detail below.


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
San Pasqual Reservation
County of San Diego
San Marcos
Escondido
Santa Ysabel Reservation
Carlsbad
8F+HOV/HOT
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
4T + POE
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-23
2025
Complete Corridors
Interchange and Arterial Operational Improvement
Managed Lanes Connector
Interregional Corridor Managed Lanes
New Port of Entry
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG


2C + Ops
Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
San Pasqual Reservation
4F+4ML
County of San Diego
San Marcos
Escondido
Santa Ysabel Reservation
Carlsbad
8F+HOV/HOT
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
2C + Ops
Barona Reservation
6F/12F+4ML
Capitan Grande Reservation
Figure 2-24
2035
Complete Corridors
6F+4ML
4F+3ML
Santee
4F+ 3ML
Interchange and Arterial Operational Improvement (IAOI)
San Diego
6F+ 4ML
6F+ 2ML
Managed Lanes Connector (MLC)
IAOI & MLC
El Cajon
Sycuan Reservation
La Mesa
6F+2TL
6F+2ML
Interregional Corridor Managed Lanes
6F+3ML
Lemon Grove
4F/6F+2ML
Urban Corridor Managed Lanes
6F+2ML
Jamul Indian Village
Rural Corridors Technology and Operational Improvements
Coronado
National City
New Port of Entry
Chula Vista
6F 2ML
MILES
KILOMETERS
Imperial Beach
4T + POE
UNITED STATES
MEXICO
San Diego
Tijuana, B.C.
SANDAG


Figure 2-25
2050
Complete Corridors
Interchange and Arterial Operational Improvement (IAOI)
Managed Lanes Connector (MLC)
IAOI & MLC
Interregional Corridor Managed Lanes
Urban Corridor Managed Lanes
Rural Corridors Technology and Operational Improvements
New Port of Entry
MILES
KILOMETERS
N
SANDAG
2C + Ops
Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
6F+2ML
6F+3ML
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
6F+4ML
4F+4ML
San Pasqual Reservation
County of San Diego
San Marcos
Escondido
Carlsbad
Santa Ysabel Reservation
Mesa Grande Reservation
Encinitas
Solana Beach
Del Mar
6F/8F +4ML
4F+3ML
Poway
Barona Reservation
6F/12F+4ML
Capitan Grande Reservation
6F+4ML
4F+ 3ML
Santee
4F+ 2ML
El Cajon
Sycuan Reservation
San Diego
6F+ 4ML
6F+ 2ML
La Mesa
6F+2TL
6F+3ML
Lemon Grove
4F/6F+2ML
6F+2ML
Jamul Indian Village
Coronado
National City
4F+2ML
Chula Vista
6F 2ML
Imperial Beach
4T + POE
UNITED STATES
MEXICO
Tijuana, B.C.

Managed Lanes

Managed Lanes offer priority access to people using transit, carpooling, or vanpooling, along with emergency vehicles and low-emission vehicles with appropriate decals. Under the proposed Plan, Managed Lanes are expanded to all urban and interregional highway corridors in the San Diego region. Existing shoulders, high-occupancy vehicle travel lanes, and general-purpose travel lanes are repurposed to create Managed Lanes and maximize existing infrastructure. ~~Connectors~~ Interchange and Arterial Operation Improvements are improvements to facilities and adjacent roadways that connect two intersecting facilities~~freeways or highways~~. Managed Lane Connectors specifically connect Managed Lanes, and direct access ramps allow buses, carpools, vanpools, and motorcycles, along with emergency vehicles and low emission vehicles with appropriate decals, to access the Managed Lanes in the center of the freeway. Managed Lanes, Interchange and Arterial Operational Improvements~~Connectors~~, and Managed Lane Connectors by phase year are shown on Figures 2-23 through 2-25.

Active Transportation and Demand Management and Smart Intersection Systems

ATDM enables transportation operators to modify how infrastructure and services are utilized to better respond to changing traffic conditions. Technology also provides people with real-time travel information to help them decide how, when, and where to travel.

SIS use sensors, connected vehicle technology, and mobility applications to facilitate communication among roadway users in order to improve traffic flow, situational awareness, signal operations, and intersection safety.

Active Transportation

The Active Transportation Network in the proposed Plan represents critical connections needed to get people around and is more than just bike facilities. As is the case with current SANDAG Active Transportation projects, each of these facilities also includes safety and connectivity enhancements for people walking, riding micromobility or transit, and driving. For example, past projects have included bus islands, improvements for people with disabilities, signal improvements, sidewalk improvements, landscaping, lighting, mid-block and intersection crossing improvements, stormwater facilities, and a number of other associated treatments. In the future, these projects could also be combined with other technology improvements as they become available.

The SANDAG Active Transportation program initially focused on the development of key high-priority regional Class 1 bikeway corridors, the Bayshore Bikeway, San Diego River Trail, Inland Rail Trail, and Coastal Rail Trail. In 2010, a comprehensive regional bike network was developed in Riding to 2050, the San Diego Regional Bike Plan (SANDAG 2010)). The network includes a regionwide, connected system of bikeways intended to be safe and comfortable for people of all ages and abilities.

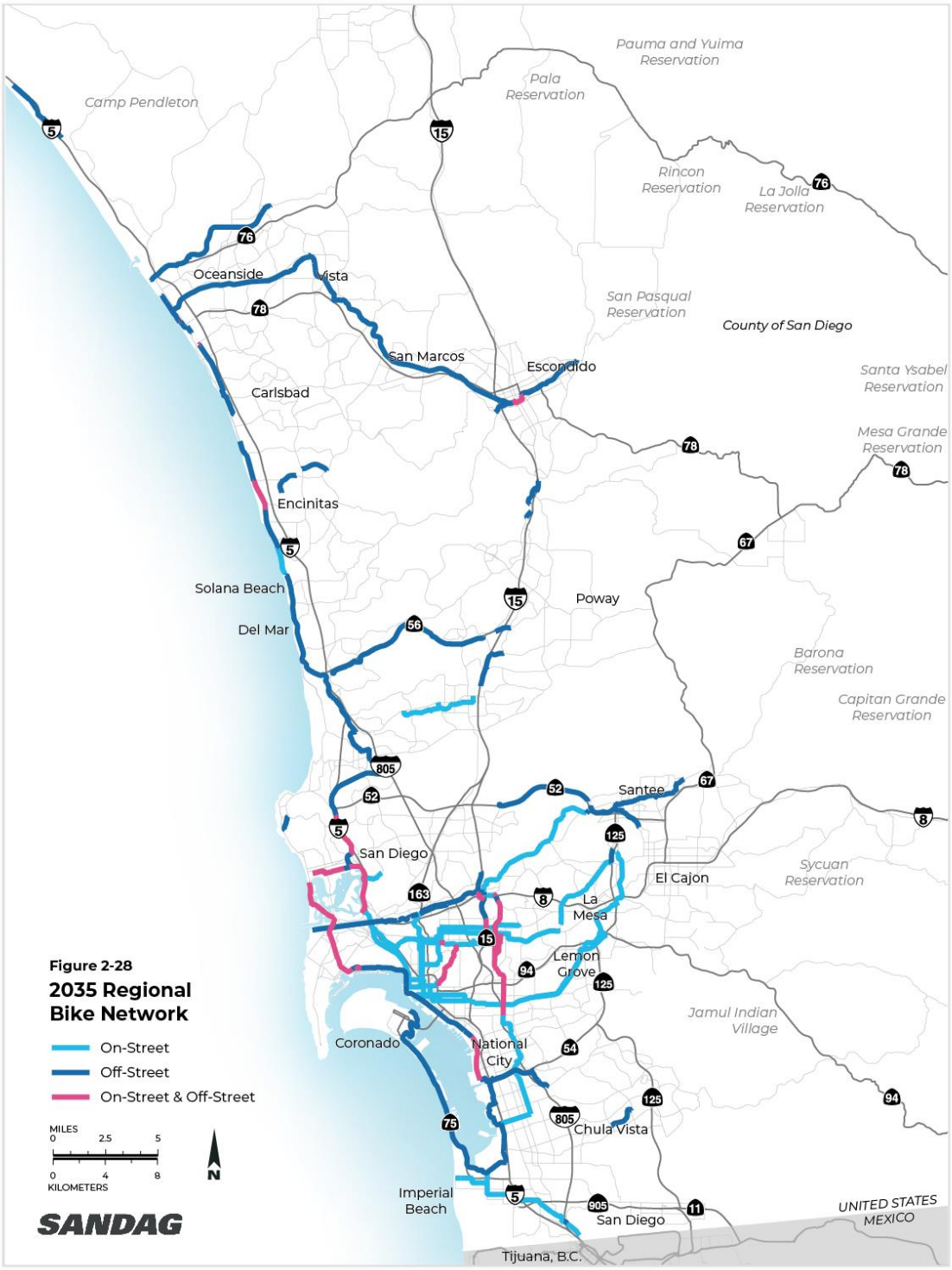
In October 2011, SANDAG adopted the 2050 Regional Transportation Plan/Sustainable Communities Strategy (2050 RTP/SCS), which made an unprecedented commitment to active transportation. In September 2013, the SANDAG Board of Directors approved $200 million in local transportation funding, intended to be leveraged for and supplemented with grant funding, to implement the Regional Bike Plan Early Action Plan (EAP). The EAP is a network of 38 high-priority projects, totaling roughly 77 miles of new bikeways from Riding to 2050 that will make it much easier for people to ride their bikes to school, work, transit stations, and other major destinations. Since that time, SANDAG has been working on public outreach, environmental review, design, and

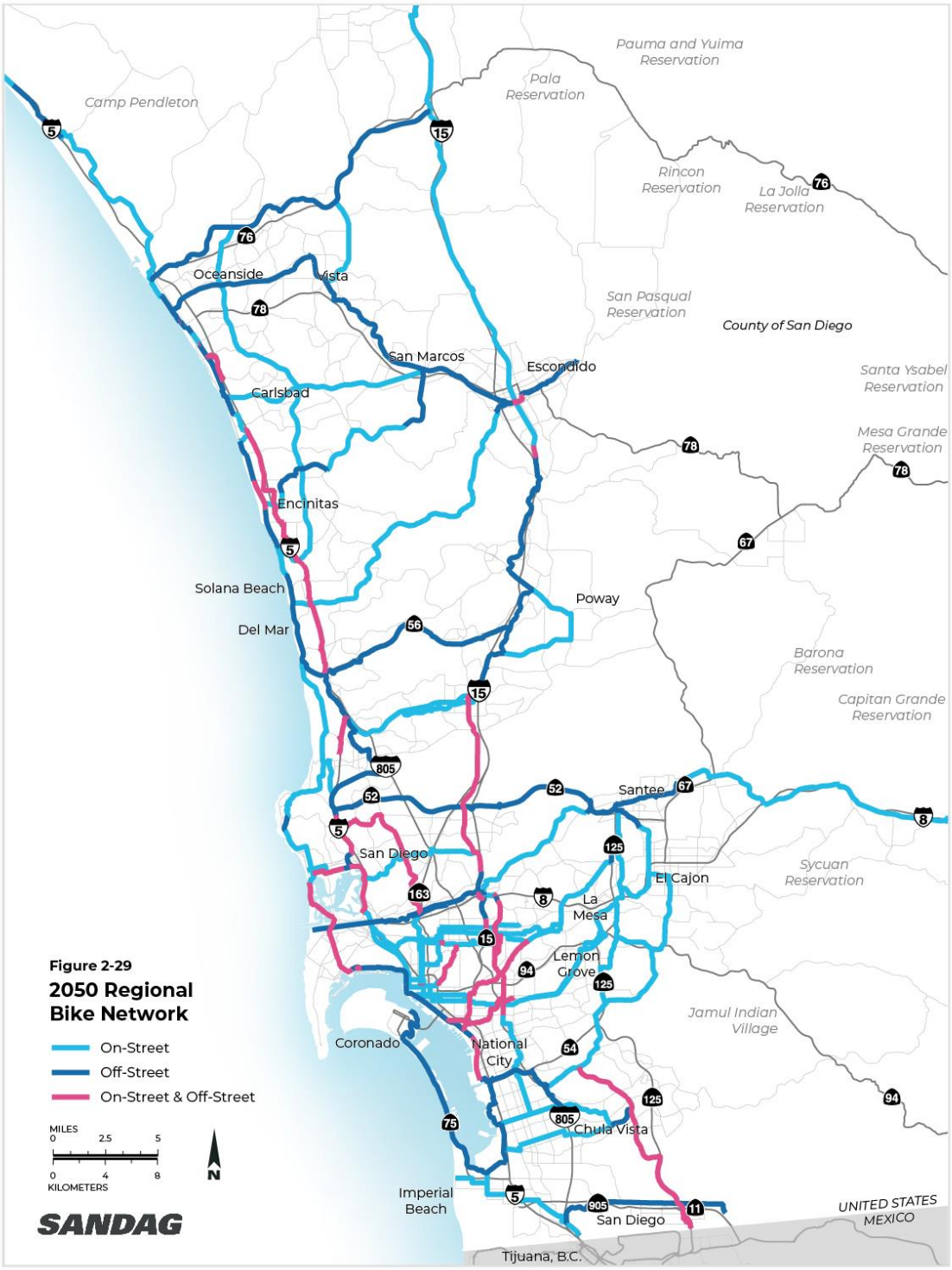
construction to complete the EAP. The proposed Plan maintains the construction of the Adopted Regional Bike Network as defined in Riding to 2050, prioritizing the funded EAP projects first.

Figure 2-26 shows the Adopted Regional Bike Network and on- or off-street designation (i.e., whether or not the bicycle facility is on a roadway utilized by motor vehicle traffic). Figures 2-27 through 2-29 show the Regional Bike Network by phase.


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
San Pasqual Reservation
County of San Diego
San Marcos
Escondido
Santa Ysabel Reservation
Carlsbad
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
Sycuan Reservation
El Cajon
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-26
Adopted Regional Bike Network
Facility Type
Off Street Bikeway
On Street Bikeway
MILES
KILOMETERS
N
SANDAG


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
San Pasqual Reservation
County of San Diego
San Marcos
Escondido
Santa Ysabel Reservation
Carlsbad
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-27
2025 Regional Bike Network
On-Street
Off-Street
On-Street & Off-Street
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
San Pasqual Reservation
County of San Diego
San Marcos
Escondido
Santa Ysabel Reservation
Carlsbad
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-28
2035 Regional Bike Network
On-Street
Off-Street
On-Street & Off-Street
MILES
KILOMETERS
N
SANDAG


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
San Pasqual Reservation
County of San Diego
San Marcos
Escondido
Carlsbad
Santa Ysabel Reservation
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
Sycuan Reservation
El Cajon
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-29
2050 Regional Bike Network
On-Street
Off-Street
On-Street & Off-Street
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG

Rural Corridors

In addition to the 11 Major Travel Corridors in the San Diego region, there are several Rural Corridors located primarily in the eastern two-thirds of the region. Figure 2-30 depicts the Rural Corridors. Rural Corridors provide rural towns and lands access and connectivity to the interstate system. Under the proposed Plan, Rural Corridors are improved with a focus on safety through shoulder widening, curve straightening, and integration of ATDM and SIS features. Most of these Rural Corridor projects are derived from the Intraregional Tribal Transportation Study (SANDAG 2018) and are shown in Table B-1 of Appendix B. Improvements to SR 67 are incorporated into the San Vicente Major Travel Corridor and are shown in Table B-2 of Appendix B.

Arterial Projects

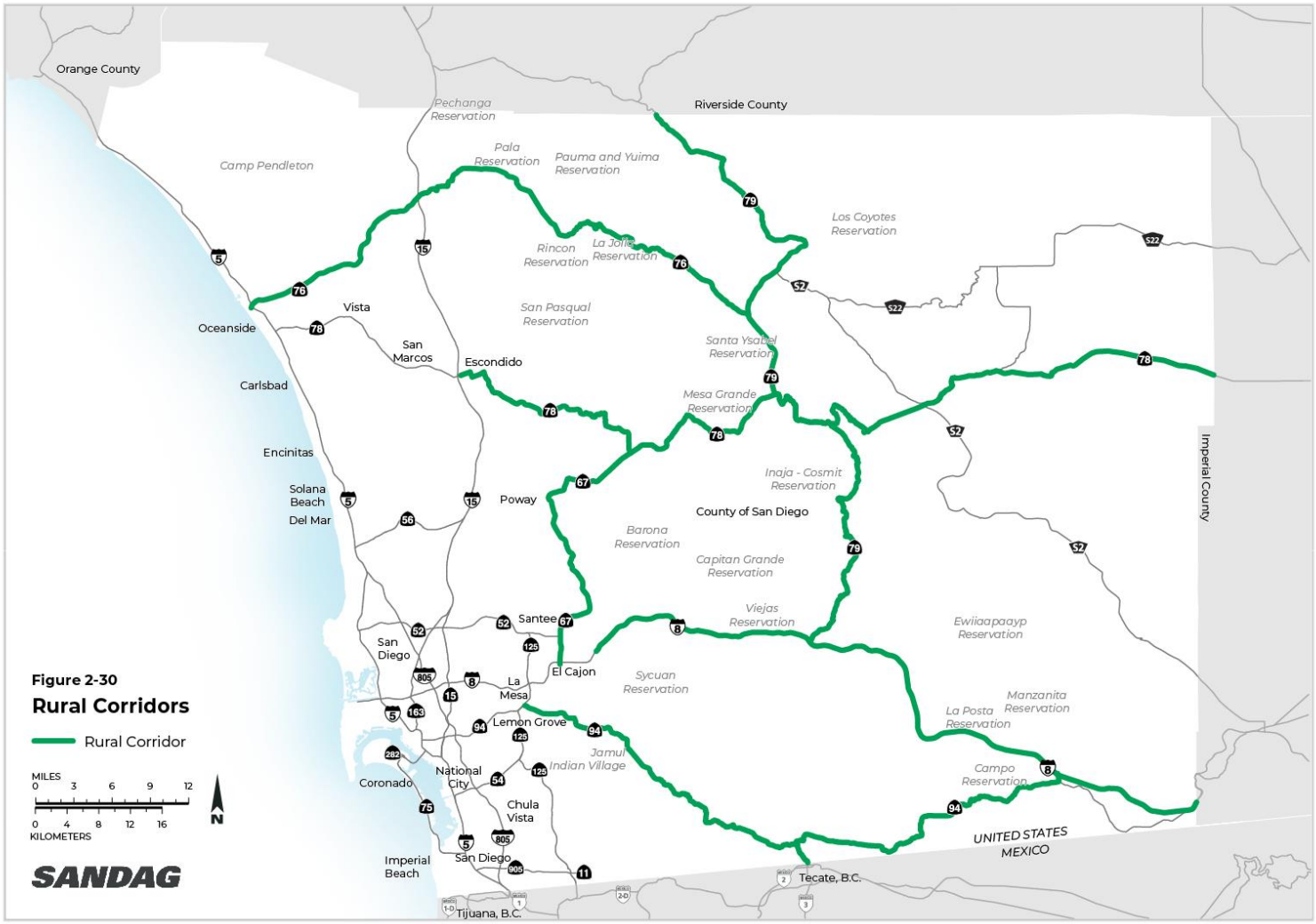
Regional arterials are longer contiguous routes that provide accessibility between communities within the region and that may also allow subregional trips to avoid freeway travel. The Regional Arterial System (RAS) constitutes part of the local street and road network that, in conjunction with the system of highways and transit services, provides for a significant amount of mobility throughout the region. The RAS includes roads eligible for the Regional Transportation Congestion Improvement Program included in the TransNet Ordinance and other funding. The RAS was last updated through an extensive process as part of the 2030 RTP (November 2007). Minor adjustments were requested and incorporated in subsequent Regional Plans and in the proposed Plan. An RAS has been included as part of the RTP since 1989 and includes over 1,000 miles of roads. Figure 2-31 depicts the RAS.

The proposed Plan includes near-term Arterial Projects that are included in the Air Quality Conformity Analysis found in Appendix C of the proposed Plan. Arterial projects are shown in Table B-3 of Appendix B of this EIR, and projects that are part of the RAS are so indicated.

Goods Movement

San Diego has a diverse and expansive goods movement network. The region serves nearly every mode of freight between its interstate highways and arterials, rail corridors, land ports of entry, maritime port, and international airport. San Diego also enjoys a distinct competitive advantage from its proximity to the U.S.–Mexico border. The California–Baja California megaregion hosts one of the world's strongest cross-border supply chains, with over 2 million trucks crossing bidirectionally through San Diego's Otay Mesa and Tecate ports of entry in 2019 alone.

The proposed Plan includes no additional improvements related to goods movement beyond those identified in the phased improvements shown in Tables B-2 and B-4 through B-13 of Appendix B. Only self-financed projects and/or roadway and railway projects with dual passenger and freight benefits are included as those are funded through those specific sources (i.e., transit or highway capital dollars).


Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Sycuan Reservation
Ewiiaapaayp Reservation
La Posta Reservation
Manzanita Reservation
Campo Reservation
Jamul Indian Village
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
San Diego
Imperial Beach
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 2-30
Rural Corridors
Rural Corridor
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
San Pasqual Reservation
County of San Diego
San Marcos
Escondido
Carlsbad
Santa Ysabel Reservation
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-31
Regional Arterial System
Freeways and Highways
Regional Arterials
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG

Phased Complete Corridor Network Improvements

By 2025

Additional major transportation network improvements include new Managed Lanes on I-5 from Manchester Avenue to Vandegrift, new toll lanes on SR 11 to the Otay Mesa Port of Entry (POE), Interchange and Arterial Operational improvements at SR 94 and SR 125, Otay Mesa POE Commercial Vehicle Enforcement Facility (CVEG) modernization, pilot programs for streamlining commercial vehicle operations for reducing wait times at the Otay Mesa POE, improvements to the Otay Mesa POE southbound truck route, including Otay Truck Route and La Media Road, and tolling equipment and Regional Border Management System investments on SR 11. Funds for optional support such as ongoing maintenance and rehabilitation of the Complete Corridor system are included in the 2025 phase as well.

By 2025, SIS technology investments would be made on the following corridors: I-5, I-15, SR 15, I-805, I-8, SR 78, SR 56, SR 52, SR 94, SR 54, SR 163, SR 125, SR 905, and SR 67. There also would be over 25 improvements to local arterial streets at locations throughout the region, including widenings and extensions of existing roadways, now or replaced bridges, and realignments. Approximately 10 additional regional active transportation projects would be constructed by 2025 in addition to funding support of local bike investments made by the jurisdictions. Several of the regional active transportation projects are in the City of San Diego, but also in other jurisdictions in coastal and inland north county and in coastal south county.

By 2035

Additional major transportation network improvements include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, SR 125, I-5, I-8, I-15, and I-805. Direct Access Ramps (DARs) are assumed at: I-5/Clairemont Mesa Boulevard, I-5/Voigt Drive, and SR 125/Spring Street/SR 94; and an Interchange and Arterial Operational Improvement ~~Technology Connector~~ is assumed at I-5 and SR 78. ATDM improvements are assumed on I-5, I-805, I-15, and I-8; and SR 15, SR 52, SR 56, SR 78, SR 94, SR 54, SR 125, SR 67, SR 905, and SR 163. Also, shoulder widening and straightening improvements are included on SR 67 from Mapleview Street to Dye Road. Roadway improvements also include freight route designation and access to assist goods movement. Funds for optional support such as ongoing maintenance and rehabilitation of the Complete Corridor system is included in the 2025 to 2035 phase as well.

By 2035, there would be five additional improvements to local arterial streets and over 50 additional regional active transportation projects in locations throughout the region. Several of the regional active transportation projects are in the City of San Diego, but also in other jurisdictions.

By 2050

Additional major transportation network improvements include new Managed Lanes and Managed Lane Connectors on SR 52, SR 56, SR 54, SR 125, and SR 905, and on I-5, I-8, 1 I-5, and I-805. DARs are assumed at SR 125/Jamacha Boulevard, SR 905/Beyer Boulevard, and SR 905/Siempre Viva Road; and an Interchange and Arterial Operational Improvement is ~~Technology Connectors are~~ assumed at ~~I-5/I-8.~~ I-5/SR 56~~. I-5/SR 94. I-15/SR 56. and SR 94/SR 125~~. Rural corridor investments are assumed on SR 76, SR 78, SR 79, SR 94, and I-8. Roadway improvements also include goods movement support with Harbor Drive multimodal corridor improvements, and the Otay Mesa POE pedestrian bridge. Funds for optional support such as ongoing maintenance and rehabilitation of the Complete Corridor system are included in the 2050 phase as well.

By 2050, there are nearly 60 additional regional active transportation projects planned in locations throughout the region.

The phased Complete Corridor transportation network improvements in the proposed Plan, organized by each Major Travel Corridor and denoted by Active Transportation (AT), Complete Corridor (CC), and Goods Movement (GM), are shown in Tables B-2 and B-4 through B-13 of Appendix B. The phased Rural Corridor projects in the Proposed Plan are shown in Table B-1 of Appendix B. The phased Arterial Projects in the proposed Plan are shown in Table B-3 of Appendix B.

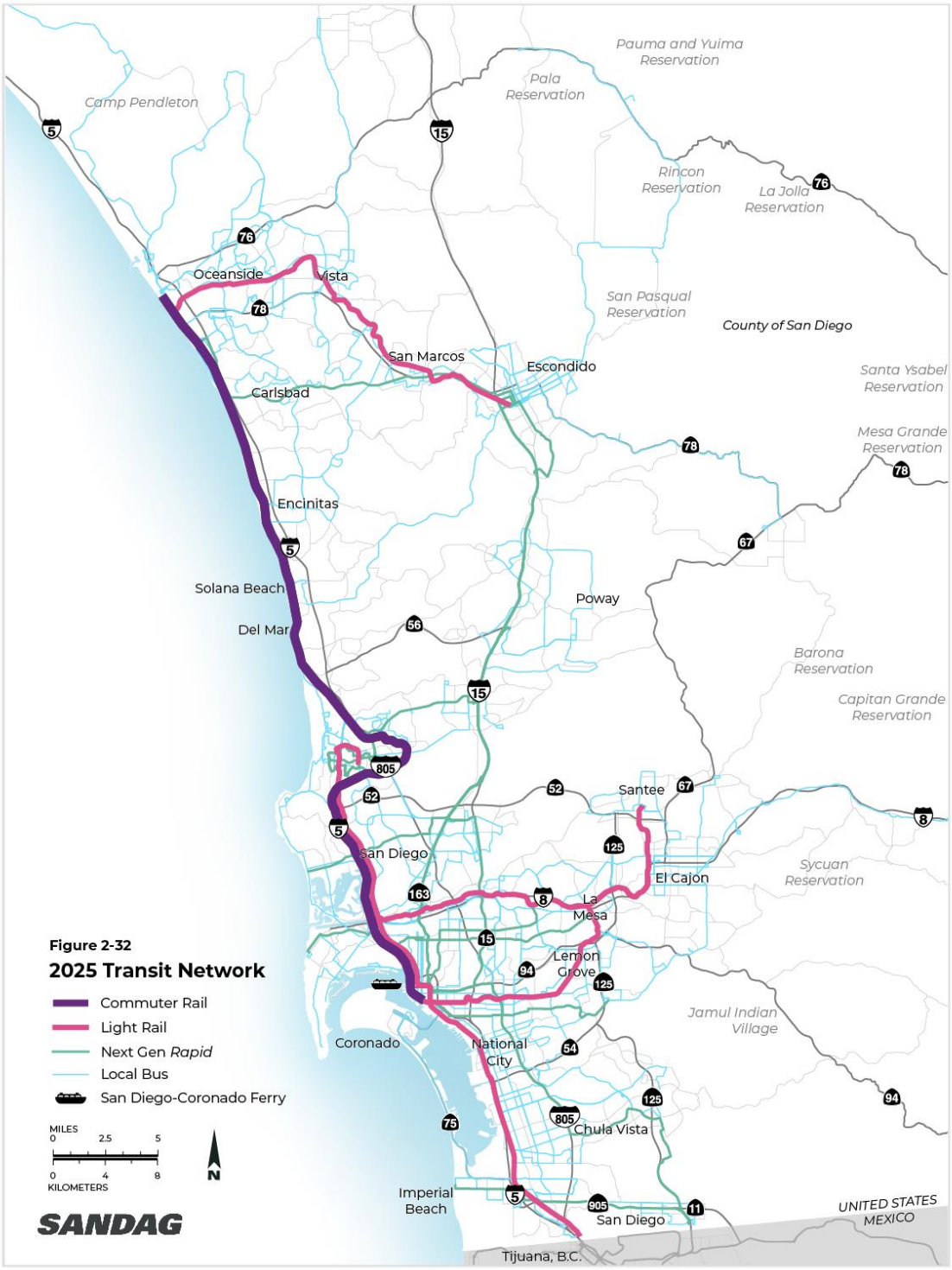
TRANSIT LEAP

Transit Leap will create a complete network of high-speed, high-capacity, and high-frequency transit services that connect major residential areas with employment centers and attractions throughout the San Diego region. Transit Leap services will connect to supporting Flexible Fleets in Mobility Hubs. New highspeed transit services—covering longer distances with limited stops—may be separated from vehicle traffic with bridges, tunnels, or dedicated lanes. Improvements to existing transit services—such as the Trolley, COASTER, SPRINTER, and Rapid—may include additional rail tracks, more frequent service, dedicated transit lanes, and traffic signal priority to keep transit moving quickly. Modal maps of Transit Leap services in the proposed Plan for years 2025, 2035, and 2050 are shown on Figures 2-32 through 2-34, respectively. The attributes and specific functionalities of Transit Leap services in the proposed Plan are shown below in Table 2-10.

Table 2-10
Transit Leap Services Included in the Proposed Plan

Type of Service	Purpose	Speed	Distance and Station Spacing	Infrastructure
Commuter Rail	Commuter Rail lends itself to longer trips and interregional travel.	Operates with speeds up to 110 mph.	Routes can exceed distances of over 100 miles, with spacing of 10 miles or more between stations.	Transit Leap Commuter Rail operates exclusively on fully grade separated guideways, similar to high-speed rail.
Light Rail	Facilitate shorter, more regional trips than Commuter Rail.	These services operate at average speeds of up to 30 mph, with a maximum speed of 55 mph.	LRT routes generally have station spacing of 1 mile at minimum.	LRT services are partially grade separated guideways, such as the current light rail service in the region (MTS Trolley and the SPRINTER).

Type of Service	Purpose	Speed	Distance and Station Spacing	Infrastructure
Next Generation *Rapid*	Next Generation *Rapid* services seek to improve existing premium or express bus services by leveraging technology and dedicated bus infrastructure to improve operating speeds.	Next Generation *Rapid* services operate at average speeds of up to 35 mph, with a maximum of 65 mph.	Route range from 10 to 40 miles in length with station spacing from 0.5 to 5 miles.	These services run in a fixed guideway or a dedicated lane during peak periods on major arterial corridors and freeway managed lanes, requiring vehicle priority to reduce or minimize conflicts.
Local Bus Routes and Flexible Fleets	These services better facilitate local, short distance trips. Future services may be supplied using on-demand Flexible Fleet vehicles (for more detail see Flexible Fleets section)	Local Bus and Flexible Fleet services operate at average speeds up to 25 mph, with a maximum speed of 65 mph.	These local routes can have route distances of various lengths, with stations spaced from 0.25 to over 1 mile in length.	Buses receive vehicle priority at critical spots along the route, as well as at major signalized intersections. Flexible Fleets services are similar to existing local bus services in that they run on major roadways and local streets


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
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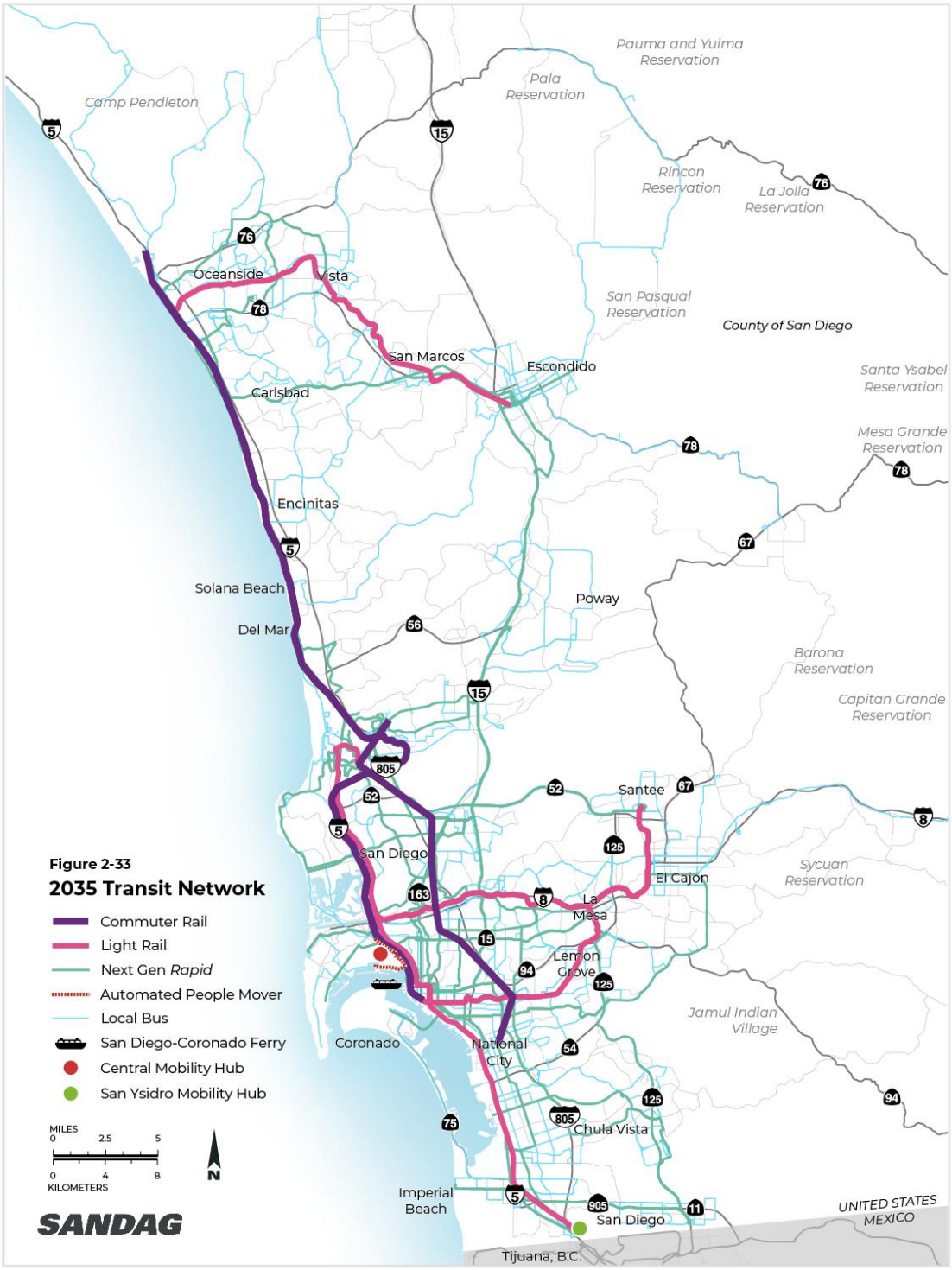
San Pasqual Reservation
County of San Diego
San Marcos
Escondido
Carlsbad
Santa Ysabel Reservation
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-32
2025 Transit Network
Commuter Rail
Light Rail
Next Gen Rapid
Local Bus
San Diego-Coronado Ferry
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG


Pauma and Yuima Reservation
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Rincon Reservation
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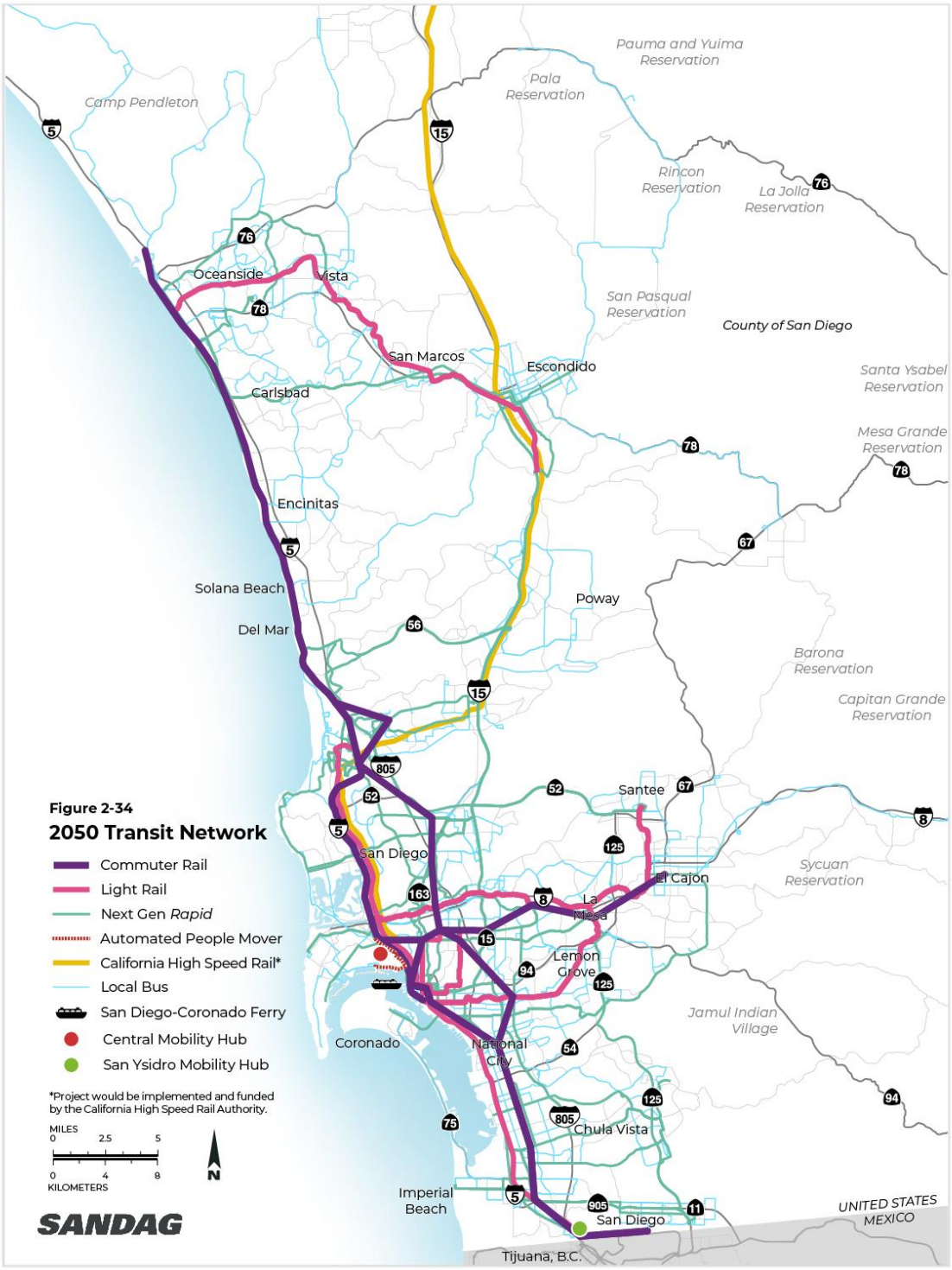
County of San Diego
San Marcos
Escondido
Carlsbad
Santa Ysabel Reservation
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
UNITED STATES
MEXICO
Figure 2-33
2035 Transit Network
Commuter Rail
Light Rail
Next Gen Rapid
Automated People Mover
Local Bus
San Diego-Coronado Ferry
Central Mobility Hub
San Ysidro Mobility Hub
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
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La Jolla Reservation
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Mesa Grande Reservation
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Barona Reservation
Capitan Grande Reservation
Santee
Sycuan Reservation
San Diego
El Cajon
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
UNITED STATES
MEXICO
Figure 2-34
2050 Transit Network
Commuter Rail
Light Rail
Next Gen Rapid
Automated People Mover
California High Speed Rail*
Local Bus
San Diego-Coronado Ferry
Central Mobility Hub
San Ysidro Mobility Hub
*Project would be implemented and funded by the California High Speed Rail Authority.
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG

Phased Transit Leap Network Improvements

By 2025

From 2021 to 2025, major transportation network improvements and programs would include double-tracking at certain locations on the Los Angeles–San Diego–San Luis Obispo (LOSSAN) rail corridor along with a station addition in the ~~Gaslamp Quarter,~~Downtown San Diego. The 2025 transit network also includes Rapid Route 10 from La Mesa to Ocean Beach, Rapid Route 12 from Spring Valley to Downtown San Diego, Rapid Route 292 from Pacific Beach to Kearny Mesa, and Rapid Route 450 from Oceanside to Escondido. Funds for operational support, maintenance facilities, and vehicle purchases are included in the 2025 phase, plus the inclusion of local bus route frequency enhancements.

By 2035

From 2026 to 2035, major transportation network improvements and programs would include continued double tracking at certain locations on the LOSSAN rail corridor, increases in COASTER frequencies, Del Mar Tunnel, new stations at Central Mobility Hub and at Camp Pendleton, and a Grade Separation at Leucadia Boulevard. The 2035 phase also includes a major new commuter rail line (Route 582) between National City and Sorrento Mesa in addition to light rail investments with SPRINTER, Blue Line, and Orange Line double tracking and grade separations. Double tracking on the Green Line also is included. A majority of the Rapid network is complete by 2035 and includes Rapid Routes 28, 30, 41, 120, 235, 237, 238, 295, 440, 471, 473, 474, 477, 625, 630, 637, 640, 709, 870, 890, 910, and 950, along with the Central Mobility Hub and station with connecting Automated People Mover. An additional Anchor Mobility Hub is assumed at the San Ysidro Transit Center. Funds for operational support, maintenance facilities, and vehicle purchases, along with increased local bus frequencies, are included in the 2035 phase as well.

By 2050

From 2026 to 2035, major transportation network improvements and programs would include continued double tracking at certain locations on the LOSSAN rail corridor, increases in COASTER frequencies, Sorrento Mesa and UTC tunnels, and a new station at Balboa Avenue. The 2050 phase also includes three major new commuter rail lines. These include routes between Downtown San Diego and El Cajon (Route 581); National City to the US Border (Route 582 [Extension]), and Central Mobility to the US Border (Route 583). It also includes light rail investments with SPRINTER, Green Line, and Orange Line double tracking. Double tracking and grade separations on the Blue Line also are included. The final components of the Rapid network are completed by 2050 including the following Rapid Routes: 555 (Tram), 103, 104, 293, 635, and 638. Funds for operational support, maintenance facilities, and vehicle purchases, along with increased local bus frequencies are included in the 2050 phase as well.

The phased Transit Leap transportation network improvements in the proposed Plan, organized by each Major Travel Corridor and denoted by TL, are shown in in Tables B-2 and B-4 through B-13 of Appendix B.

MOBILITY HUBS

The Mobility Hubs are based on the critical connection nodes discussed above under Section 2.2.1, *Development of the Proposed Plan: A Data Driven Process*. To develop the Mobility Hubs, SANDAG evaluated each employment center node and commute origin node in terms of their land use, population density (including communities of concern), employment density, activity centers of regional significance, and unique local characteristics.

SANDAG then used ArcGIS to evaluate a selection of initial Mobility Hub coverage areas—1, 2, or 4 miles from each node. The Mobility Hubs will offer on-demand travel options and supporting infrastructure that enhance connections to high-quality Transit Leap services while helping people make short trips around their communities on Flexible Fleets. Mobility Hubs are unique to each community based on community characteristics and travel needs, and the Mobility Hub land uses have been integrated into the regional transportation system in the proposed Plan.

Under the proposed Plan, a network of 31 Mobility Hubs supports various Transit Leap and Flexible Fleet services throughout the region. A map of the Mobility Hub Network in 2050 is shown on Figure 2-35. A map of the Mobility Hubs by type overlaid with Transit Priority Areas is shown on Figure 2-36. The Mobility Hubs are an integral element of the SCS land use pattern. The SCS envisions densification in the Mobility Hub areas due to incentivized transportation infrastructure; however, that densification will be dependent on the approval of local jurisdictions. A list of the Mobility Hubs in the proposed Plan, identified by jurisdiction and envisioned type and associated transit services, is provided in Table 2-11.

Table 2-11
Mobility Hubs Included in the Proposed Plan

Mobility Hub	Type	Transit Leap Services	Flexible Fleet
Carlsbad Palomar	Major Employment Center	Commuter Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, Neighborhood Electric Vehicle (NEV) Microtransit, Last-Mile Delivery
Carlsbad Village	Coastal	Commuter Rail, Next Gen Rapid	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Carmel Valley	Suburban	Commuter Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
College Area	Suburban	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Coronado	Coastal	Next Gen Rapid	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Downtown Chula Vista	Suburban	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Rideshare, NEV Microtransit, Last-Mile Delivery
El Cajon	Gateway	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Encinitas	Coastal	Commuter Rail, Next Gen Rapid	Micromobility, Rideshare, Microtransit, NEV Microtransit
Escondido	Gateway	Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Imperial Beach	Coastal	Commuter Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Kearny Mesa	Major Employment Center	Commuter Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery

Mobility Hub	Type	Transit Leap Services	Flexible Fleet
La Jolla	Coastal	Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
La Mesa	Major Employment Center Suburban	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Lemon Grove	Suburban	Light Rail	Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Mira Mesa	Suburban	Next Gen Rapid	Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Mission Valley	Major Employment Center	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
National City	Major Employment Center	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Ocean Beach	Coastal	Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Oceanside	Gateway	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Otay Ranch	Suburban	Next Gen Rapid	Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Pacific Beach	Coastal	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
San Marcos	Major Employment Center	Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Solana Beach	Coastal	Commuter Rail, Next Gen Rapid	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Sorrento Valley	Major Employment Center	Commuter Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Southeast San Diego	Suburban	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Southwest Chula Vista	Suburban	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
U.S.–Mexico Border	Gateway	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
University Community	Major Employment Center	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery

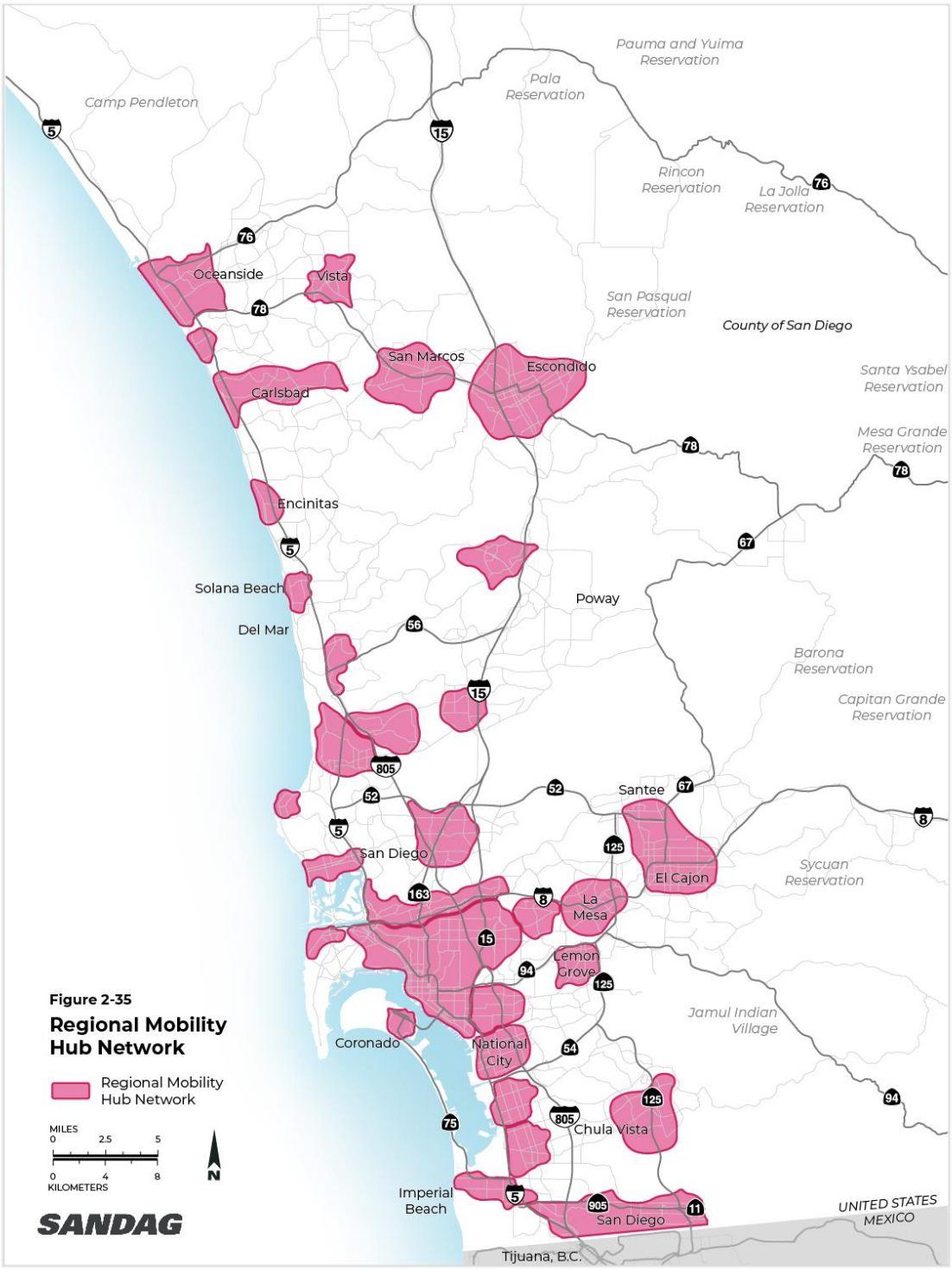
Mobility Hub	Type	Transit Leap Services	Flexible Fleet
Urban Core	Urban	Commuter Rail, Light Rail, Next Gen Rapid	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Vista	Suburban	Light Rail, Next Gen Rapid	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
West Bernardo	Major Employment Center	Next Gen Rapid	Carshare, Rideshare, Microtransit, Last-Mile Delivery

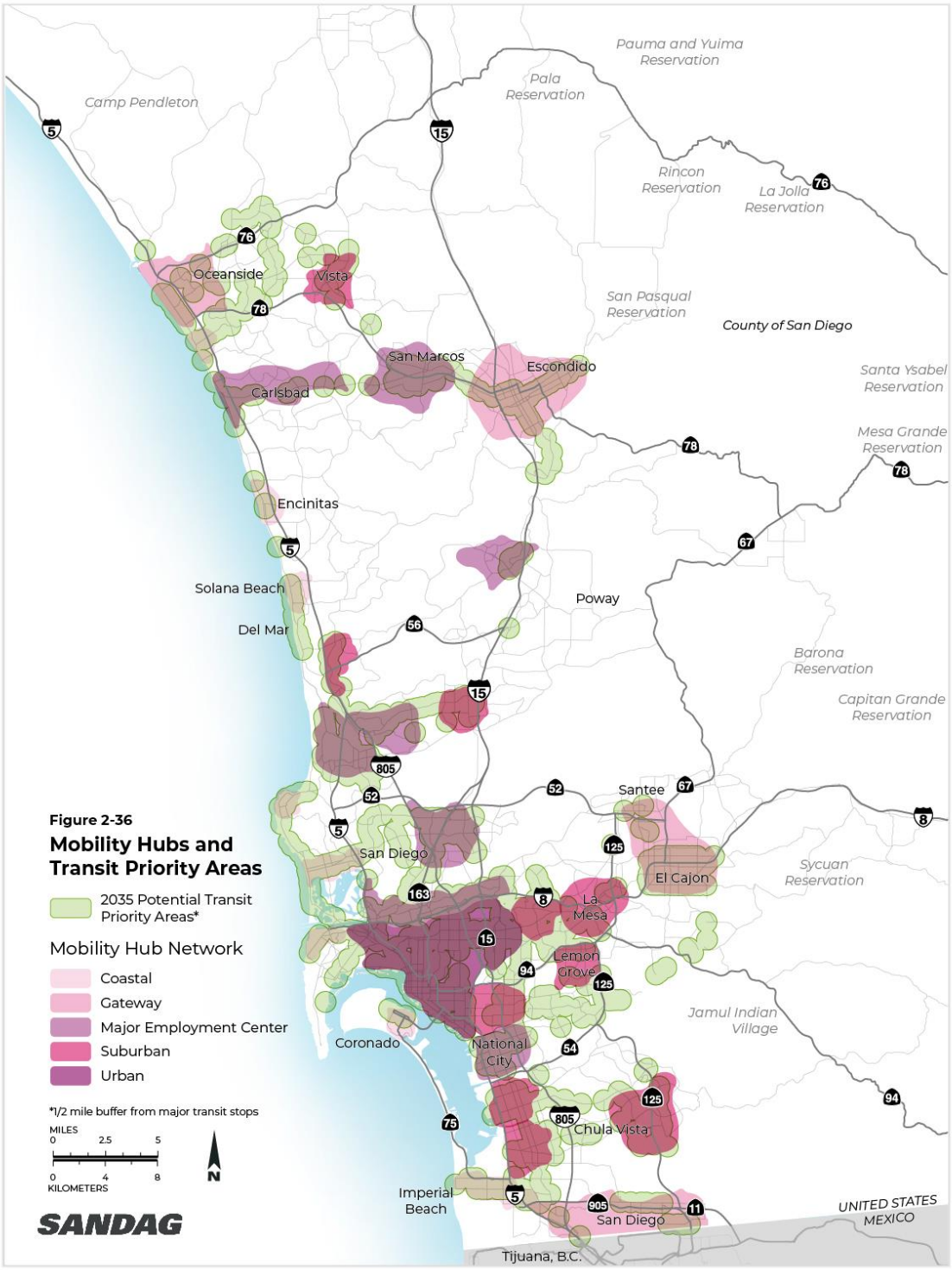
Phased Mobility Hub Network Improvements and Investments

The Mobility Hubs element of the proposed Plan includes both transportation investments and supporting land uses. The proposed Plan envisions making investments to promote transportation connections in 29 Mobility Hub areas throughout the region in collaboration with local jurisdictions. The proposed Plan also identifies expanded investments in two additional intermodal transit center Mobility Hub projects under the proposed Plan: the Central Mobility Hub (CMH) in downtown San Diego and the San Ysidro Mobility Hub (SYMH) at the U.S.–Mexico border. The CMH and SYMH are fully integrated in the transit services envisioned under Transit Leap beginning in 2035 and are depicted on Figures 2-33 and 2-34.

The proposed CMH would offer multimodal connectivity and be served by the San Diego Trolley light rail, Amtrak intercity rail, COASTER commuter rail, buses, taxis, and other mobility services.

The CMH would also include a high-speed, fixed-guideway transit connection between the CMH and San Diego International Airport (SDIA), with up to four high-frequency transit stations likely provided at CMH, the Airport Rental Car Center, Harbor Island East Basin, and SDIA, as well as supporting infrastructure. The proposed CMH would include modifications to I-5 to enhance CMH access; roadway modifications to improve SDIA access and/or accommodate transit connections; and pedestrian, bicycle, and other active transportation improvements promoting safety and connectivity in accordance with the Midway–Pacific Highway Community Plan and Regional Bike Plan, including new connection(s) across I-5 between the CMH and the Old Town community and the Coastal Rail Trail along Pacific Highway.


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
San Pasqual Reservation
County of San Diego
San Marcos
Escondido
Carlsbad
Santa Ysabel Reservation
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-35
Regional Mobility Hub Network
Regional Mobility Hub Network
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG
These maps show generalized regional Mobility Hub boundaries for planning purposes and are not intended to be binding or precise. Mobility Hub boundaries are subject to refinement in close coordination with the affected jurisdiction(s).


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
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San Marcos
Escondido
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Del Mar
Barona Reservation
Capitan Grande Reservation
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-36
Mobility Hubs and Transit Priority Areas
2035 Potential Transit Priority Areas*
Mobility Hub Network
Coastal
Gateway
Major Employment Center
Suburban
Urban
*1/2 mile buffer from major transit stops
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG
These maps show generalized regional Mobility Hub boundaries for planning purposes and are not intended to be binding or precise. Mobility Hub boundaries are subject to refinement in close coordination with the affected jurisdiction(s).

The proposed location of the CMH is the Navy Old Town Campus (OTC), a 70.5-acre site located west of I-5 and south of Old Town. The Navy initiated its Environmental Impact Study (EIS) process under the National Environmental Policy Act (NEPA) for the OTC site on January 24, 2020 (U.S. Navy 2020). The Navy's Draft EIS evaluates the potential environmental effects associated with modernization of OTC to support Naval Information Warfare Systems Command's (NAVWAR) current and future operational readiness. A CMH at OTC is included in two of the development scenarios evaluated in the Navy's Draft EIS. While evaluation of a CMH at OTC was outside of the scope of the Navy's Draft EIS, SANDAG initiated the EIR process under CEQA for the CMH on April 21, 2021 (SANDAG 2021d). SANDAG's EIR for the CMH will propose siting the CMH at OTC, but is also considering other alternatives. The proposed SYMH will identify and develop long-term Mobility Hub implementation strategies that integrate land use and multimodal travel options with "safe street" infrastructure and supporting amenities consistent with investments identified in the proposed Plan, the South Bay to Sorrento Comprehensive Multimodal Corridor Plan, and the 2021 California–Baja California Border Master Plan. The mobility strategies are expected to be focused within the area of the San Ysidro Mobility Hub spanning between the existing San Ysidro Transit Center, Virginia Avenue Transit Center, and the Iris Avenue Trolley Station.

The SYMB and CMH and improvements included in the proposed Plan are shown in Tables B-4 and B-5, respectively, in Appendix B.

SANDAG is also proposing funding to incentivize Mobility Hub investments for the remaining 29 hubs in the Mobility Hub Network. Phased investments in 2025, 2035, and 2050 include Mobility Hub amenities such as secure micromobility parking and e-charging, interactive travel kiosks, electric vehicle charging infrastructure, passenger loading zones, parcel delivery lockers, and carshare parking. Phased funding proposed for investments in Mobility Hubs is identified in Table B-14 of Appendix B.

FLEXIBLE FLEETS

Flexible Fleets are shared, on-demand transportation services that provide convenient and personalized travel options. While they build on the popularity of services such as rideshare, bikeshare, and scootershare, fleets can also include neighborhood shuttles and delivery services. These fleets provide services for all types of trips, 24/7, which can reduce the need to own a car. They also provide important connections between high-speed Transit Leap services and key destinations such as work or home, making it easier for commuters to choose transit. As described below, Flexible Fleets services are grouped into five categories: Micromobility, Ridehailing/Carsharing, Ridesharing, Microtransit, and Last-Mile Delivery.

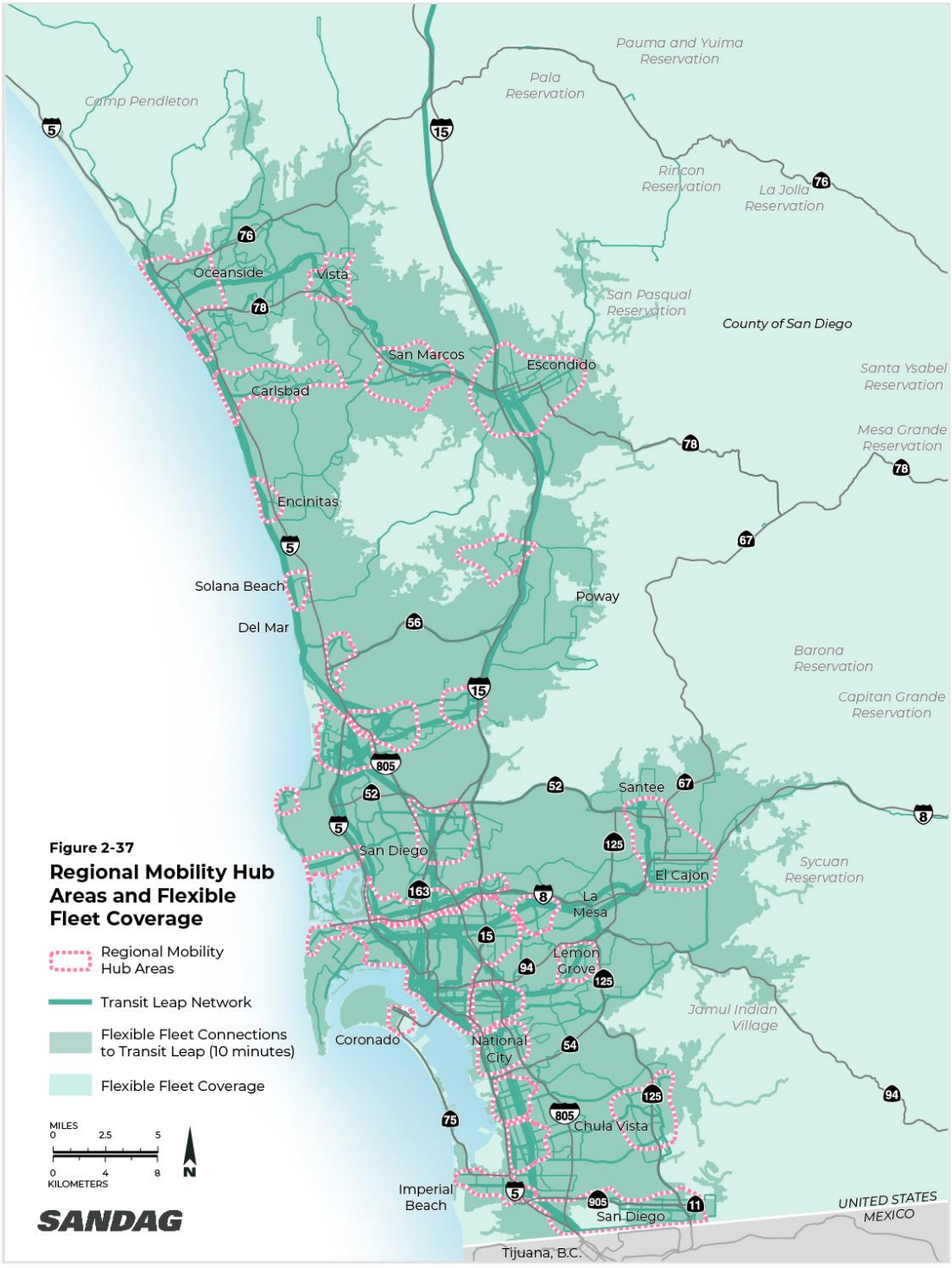
Table 2-12
Flexible Fleet Services Improvements Included in the Proposed Plan

	**Micromobility** Small, low-speed vehicles such as e-scooters, bikes, and other rideables support short trips around a community.
	**Ridehailing/Carsharing** On-demand ridehailing services allow someone to request a ride or vehicle in real time using a mobile app. Ridehailing services link the passenger with available drivers based on their trip length, number of passengers, origin, and destination. Carsharing service provides members with access to a shared vehicle. Ridehailing services will be automated in the future and operate as subscription-based services, allowing users to reserve a ride any type of vehicle for their trip.
	**Ridesharing** Drivers and passengers headed in a similar direction can share the ride in a vehicle. This includes carpool, vanpool, and pooled ride hailing services such as uberPOOL and Lyft Shared. Eventually these services will operate as automated and shared taxis that will be designed to meet passenger needs.
	**Microtransit** Multi-passenger shuttles can carry up to 15 passengers and provide rides within a defined service area. This technology-enabled transit service allows users to reserve a ride ahead of time or on demand, and it may be a more efficient option for suburban areas of the region. Smaller, all-electric shuttles, also known as neighborhood electric vehicles (NEV), also are a form of microtransit that provide a sustainable and convenient solution for short trips around communities.
	**Last-Mile Delivery** Driverless vehicles, e-bikes, drones, and bots will deliver a range of goods from a distribution hub to individual consumers, businesses, or smart lockers at Mobility Hubs. Some last mile delivery services can consolidate trips by carrying passengers and goods at the same time.

These five Flexible Fleets service types are integrated with the other 5 Big Moves, offering greater transportation connectivity throughout the region. Figure 2-37~~6~~ depicts Flexible Fleets coverage under the proposed Plan.

Phased Flexible Fleet Network Investments

Flexible Fleets are primarily accessible through mobile apps and can be operated by public and private agencies or through partnerships. SANDAG is not advancing specific Flexible Fleet projects under the proposed Plan but is proposing funding to incentivize Flexible Fleets investments. Phased investments in 2025, 2035, and 2050 are expected to cover operations for Flexible Fleet services, including micromobility, ridehail/carshare, rideshare microtransit, and last mile delivery. Phased funding proposed for investments in Flexible Fleets Networks is shown in Table B-14 in Appendix B..


Pauma and Yuima Reservation
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Barona Reservation
Capitan Grande Reservation
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 2-37
Regional Mobility Hub Areas and Flexible Fleet Coverage
Regional Mobility Hub Areas
Transit Leap Network
Flexible Fleet Connections to Transit Leap (10 minutes)
Flexible Fleet Coverage
MILES
KILOMETERS
N
SANDAG
These maps show generalized regional Mobility Hub boundaries for planning purposes and are not intended to be binding or precise. Mobility Hub boundaries are subject to refinement in close coordination with the affected jurisdiction(s).

NEXT OPERATING SYSTEM (NEXT OS)

Next OS is the "brain" of the entire transportation system. It is a digital platform that compiles information from sources such as passenger vehicles, buses, ridesharing vehicles, delivery trucks, bikes, and scooters into a centralized data hub. Analysis of this data will improve how transportation is planned, operated, and experienced. Transportation operators will be able to better manage supply and demand by modifying how infrastructure and services are used throughout the day. The result will be a modernized transportation system with roads and transit services that operate smoothly and serve people better. The proposed Plan discusses how SANDAG has planned for physical transportation networks—envisioning fully realized corridors of travel, next-generation public transit, Mobility Hubs where people and mobility options come together, and Flexible Fleets that serve people with innovative and tailor-made mobility options when and where they need them. But Next OS is the digital network that will analyze data in real time from these physical networks and make them all work better—more integrated, more efficient, and most of all, more responsive to people's immediate needs.

Phased Next OS Network Improvements and Investments

By 2025

Next OS improvements by 2025 include a Data Hub to provide high speed data analytics, data repository, and data performance management platform that will bring together public transportation data and develop a public–private information exchange with companies such as Transportation Network Companies (TNCs).

By 2035

Next OS improvements in the 2026–2035 phase include: dynamic curb management including access and pricing rules; dynamic transit routing, scheduling, and communications; applications to plan, book, and pay across public and private shared services; coordinated response and control for real time operations across freeway, arterials, and transit networks; and investments to enable regional transportation system operators to collect, analyze, and share data to improve transportation systems management and operations.

By 2050

Next OS improvements include ongoing maintenance of the system.

Phased Next OS improvements are shown in Table B-15 of Appendix B.

2.5.2 AIRPORT CONNECTIVITY

The San Diego County Airport System includes 12 public use airports in the San Diego region as well as four military airports/airfields. Tijuana International Airport (TIA) is located directly south of the U.S.-Mexico border. SDIA, McClellan-Palomar, and TIA accommodate commercial, general aviation, and corporate services. Brown Field Municipal, Gillespie Field, Montgomery Field, and Ramona accommodate general aviation and corporate services. The remaining airports accommodate general aviation only, and include Oceanside Airport, Fallbrook Community Airpark, Borrego Valley Airport, Ocotillo Airport, Agua Caliente Airport, and Jacumba Airport. Military airports include Marine Corps Base Camp Pendleton, Marine Corps Air Station Miramar, Naval Air Station North Island, and Naval Outlying Landing Field Imperial Beach.

2.5.3 BORDER/PORTS OF ENTRY

The California–Baja California megaregion experiences high levels of interregional and cross-border commuting and goods transport, and there are many industries that are linked across borders. This larger region is an increasingly important trade and travel corridor, and it has a distinct global competitiveness with unique advantages. There are four POEs between San Diego County and Baja California:

- **San Ysidro–Puerta México/Ped West–El Chaparral**: One of the world's busiest international land border crossings and the most traveled between the United States and Mexico. This facility serves pedestrians and personal vehicles.
- **Cross Border Xpress (CBX)**: A privately funded hybrid crossing facility open in 2015 serving as an access terminal for ticketed users of the TIA crossing as pedestrians. It is the world's only airport terminal access facility located directly on an international boundary.
- **Otay Mesa–Mesa de Otay**: The main commercial gateway for international trade between California and Mexico. This POE ranks second in terms of trade value among all U.S. southern border POEs. This facility also processes pedestrian and personal vehicle crossings.
- **Tecate–Tecate:** A POE facility in the rural eastern portion of San Diego County serving pedestrians, personal vehicles, and commercial trucks.

A priority project within the proposed Plan's vision for the border that advances the region's ability to provide efficient cross-border mobility is the State Route 11/Otay Mesa East POE project. This project is a joint effort between SANDAG and the California Department of Transportation (Caltrans) and leverages extensive collaboration with State and federal partners in the U.S. and Mexican governments to create a 21st century border crossing for the binational megaregion. The recently completed 2021 California–Baja California Border Master Plan (Caltrans et al. 2021), is being used by SANDAG and Caltrans to develop several Comprehensive Multimodal Corridor Plans (CMCPs) for key corridors throughout the region. The South Bay to Sorrento (SB2S) CMCP effort focuses on 28 miles of one of the most congested and heavily used corridors in the San Diego region, spanning from the U.S.–Mexico border to Sorrento Valley and including critical facilities such as I-5, I-805, SR 905, major arterials, the Bayshore Bikeway, and transit services including the Trolley, Rapid lines, and local bus lines.

2.5.4 SUPPORTING POLICIES AND PROGRAMS

The proposed Plan integrates three key strategies:

- **Invest in a reimagined transportation system**: Build a network and fund services that include multimodal roadways; an expanded network of fast, frequent, and low-cost transit; 21st century technology that manages the entire transportation system and connects people to on-demand services; and zero-emission options for vehicles and micromobility.
- **Incentivize sustainable growth and development:** Collaborate with local jurisdictions and fund programs that accelerate housing production while also addressing the intertwined issues of equity, climate resilience, and mobility.
- **Implement innovative demand and system management:** Reduce solo driving and congestion through increased remote work, carsharing, vanpooling, value pricing and user fee strategies, and parking-management programs that leverage partnerships and technology.

While SANDAG can directly implement many of the projects and policies included in the proposed Plan that support these core strategies, there are several programs and policies that require partnership with local jurisdictions or other agencies. The proposed Plan identifies 11 policy and program areas that SANDAG proposes funding to incentivize collaborative actions that will further implementation of the proposed Plan as listed below:

- Land Use and Regional Growth
- Housing
- Climate Action Planning
- Climate Adaptation and Resilience
- Electric Vehicles
- Parking and Curb Management
- Transportation Demand Management
- Vision Zero
- Fix It First[4]
- Transportation System Management and Operations
- Pricing[4]

Each of these policy and program areas is discussed below. Appendix B of the Regional Plan discusses implementation actions for each area. Table 2-13 shows phased funding for Policies and Programs under the proposed Plan.

Table 2-13
Supporting Policies and Programs ($2020 millions) of the Proposed Plan

	2025	2035	2050	Total
Land Use and Habitat~~Regional Growth~~				
Planning and Capital Mobility Hub/Smart Growth/Vehicle Miles Traveled Reduction Grants	$50~~75~~	$150~~262~~	$200~~500~~	$400~~837~~
Member Agency Resources to enhance development review/processes/update policies	$10~~25~~	$50~~100~~	$75~~208~~	$135~~333~~
Habitat conservation, management, and monitoring	$169	$555	$1,363	$2,087
Housing				
Affordable Housing Grant Program	$730	$1,400	$500	$2,630
Climate Action Planning				
CAP Monitoring Program	$4	$20	$12	$37
CAP Implementation Grants	$20	$100	$150	$270
Regional Carbon Reduction Program Management	$6	$~~1~~50	$75~~150~~	$131~~306~~
Climate Adaptation and Resilience				

[4] Costs associated with these programs are incorporated into the capital investment costs identified in Appendix B.

	2025	2035	2050	Total
Climate Adaptation and Resilience Program	$8	$50~~75~~	$50~~75~~	$108~~158~~
Nature-based Climate Solutions	$40	$325	$200	$565
Resilient Capital Grants and Innovative Solutions	$20	$75~~215~~	$100	$195~~335~~
Electric Vehicles				
Incentives for Zero-Emission Vehicles	$52	$552	--	$604
EV Charging Stations	$45	$134~~133~~	$91	$270
Hydrogen Fueling Stations	--	$100	$150	$250
Zero-Emission Buses and Infrastructure	$75	$250	$332	$657
Goods Movement Vehicles and Infrastructure	$25	$100	$104	$229
Parking and Curb Management				
Member agency resource/coordination	$8	$100	$40	$148
Transportation Demand Management				
GO by BIKE	$0.2	$0.5	$1	$1
TDM Innovation and Shared Streets Grants	$1	$50	$4	$55
E-bike incentive	$5	$15	$15	$35
Program Administration	$19	$59	$89	$167
Commuter Services ~~and Bike Program~~(Vanpool, Bike Parking, Guaranteed Ride Home)	$18	$35	$56	$109
Rideshare Incentive Program	$1	$1	$2	$4
Marketing, Outreach, and Education	$11	$23	$35	$69
TDM Ordinance	$8	$40	$60	$108
Vision Zero				
Member agency project resource/coordination	$6	$25	$15	$46
Community Based Education	$4	$25	$25	$54
Capital and Planning grants	$25	$150	$150	$325
Transportation System Management and Operations				
ATDM and SIS	$681	$2,855	$1,223	$4,759
Next OS	$66	$62	$100	$228

LAND USE AND HABITAT~~REGIONAL GROWTH~~

Land use and development patterns are central to issues in the San Diego region: affordable housing, GHG emissions, equity, and mobility throughout our communities. The proposed Plan focuses on development and growth in Mobility Hub areas in order to preserve San Diego's open space and reduce vehicle miles traveled (VMT) by supporting transportation investments. Because land use authority is reserved to local jurisdictions, SANDAG will leverage partnerships with cities and the County to provide funds for transportation-related improvements and planning efforts that support smart growth in Mobility Hub areas. SANDAG will continue its existing grant programs, partner with member agencies on State funding opportunities, and provide data and technical support to assist local jurisdictions with land use planning efforts consistent with the proposed Plan. To meet the region's habitat conservation goals, the 2021 Regional Plan identifies approximately $3 billion for habitat-related efforts. This includes $2,087 million for an enhanced habitat conservation, management, and monitoring program (see Land Use and Habitat programs in Appendix K), a $565 million Nature-Based Climate Solutions Program that will promote both habitat conservation and restoration and carbon sequestration (see

Climate Adaptation and Resilience programs in Appendix K), and $300 to $500 million of land acquisition and restoration for habitat mitigation of transportation projects (incorporated in project costs presented in Appendix A to the proposed Plan).

HOUSING

California is experiencing a housing crisis, with housing demand far outstripping supply. The proposed Plan addresses the housing crisis through Mobility Hubs, bringing locations where people live and work closer together and providing more housing options for more San Diegans through increased density. SANDAG will rely on building stronger partnerships with local jurisdictions to increase housing in the region, especially housing available to low-income residents. Through grant programs and technical support, SANDAG will serve as a funding partner and resource to assist local jurisdictions in reaching the region's housing production goals.

CLIMATE ACTION PLANNING

To help reach regional and State GHG emissions–reduction targets, the proposed Plan focuses heavily on the conversion to clean transportation and a shift from personal vehicle dependency through the 5 Big Moves. To help local jurisdictions make this transition and achieve broader reductions in GHG emissions, SANDAG will provide technical assistance, guidance resources, templates, and grant funding to incorporate the 5 Big Moves and SCS actions into their Climate Action Plans (CAPs) and plan for more well-connected, sustainable, healthy communities that are accessible to all.

CLIMATE ADAPTATION AND RESILIENCE

The San Diego region is anticipated to feel the effects of climate change through hotter and more frequent heat waves, prolonged droughts, increased wildfires, rising sea levels, and destructive storm surges. The proposed Plan aims to better prepare San Diego communities and habitats for these climate change impacts by considering evacuation and rapid mobility needs in our transit corridors, evaluating and considering climate vulnerabilities to the region's transportation infrastructure, and utilizing natural lands and conservation to absorb and protect against climate change impacts. SANDAG will establish a coordinated effort across agencies and local jurisdictions for a more holistic, comprehensive, equitable, sustainable, and resilient region.

ELECTRIC VEHICLES

The electrification of cars, trucks, and buses is a key initiative in the 5 Big Moves and the proposed Plan. Electrification is included in the proposed Plan as a way to reach regional GHG emission–reduction targets. Electric vehicles (EVs) are zero-emission vehicles that include plug-in battery EVs and hydrogen fuel cell EVs. SANDAG aims to incentivize and encourage the incorporation of all types of EVs into Flexible Fleets, Transit Leap, and goods movement and to support funding programs that increase the number of EVs and charging stations throughout the region and within Mobility Hubs and as part of the Complete Corridor strategy.

PARKING AND CURB MANAGEMENT

Proactively managing parking and curb space enables more people to access places within our communities using alternatives to driving. The proposed Plan addresses curb management by proposing strategies to help balance competing and changing travel needs at the curb while remaining flexible to resident, employee, business, and visitor needs. While the authority to implement parking and curb policies remains with local

jurisdictions, SANDAG plays a unique role of informing these policies by sharing resources and best practices and serving as the regional Mobility Data Clearinghouse.

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) innovations have the potential to transform the way people travel within and between communities. Managing demands on the existing transportation system is a vital strategy for making the overall system more effective in reducing drive-alone commute trips. SANDAG will continue to administer and monitor the iCommute program by providing regional rideshare, employer outreach, and bike education and secure parking services to help reduce commute-related traffic congestion and VMT. Beyond commute trips, TDM programs are expanded to include grants and incentives that make it easier and safer to use active modes for short trips.

VISION ZERO

Traffic-related fatalities and serious injuries are a critical and preventable public health and equity issue in the San Diego region. Vision Zero is a national campaign to eliminate all traffic-related deaths and serious injuries by focusing on policies and the redesign of streets to create a transportation system that is safe for everyone. In adopting Vision Zero, SANDAG will work toward Zero by collecting and analyzing crash data to identify safety issues and recommend solutions; developing a regional safety policy; continuing to construct the Regional Bike Network; working with local jurisdictions to conduct outreach for and build out their complete streets networks; and funding educational programs, including opportunities to collaborate with tribal nations.

FIX IT FIRST

The proposed Plan envisions many improvements to the San Diego transportation system and network to set the region up for success as a world-class transportation system. To optimize investments in the region's transportation infrastructure, the proposed Plan and the 5 Big Moves focus on improving upon existing roads, rails, and sidewalks. The Fix It First strategy aims to repair existing roads and create a system for sustained maintenance in the future, creating a safe and efficient transportation network for all users.

TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS

Transportation System Management and Operations (TSMO) employs a series of intelligent transportation system strategies designed to maximize the capacity and efficiency of the existing and future transportation system. TSMO includes the establishment of institutional and governance actions to help advance and facilitate cross-agency collaboration to ensure existing and proposed transportation systems are not operated or managed as independent systems but as a multimodal transportation system. TSMO activities focus on determining how people, processes, and tools can facilitate increased cross-agency collaboration during the planning, development, and operations of intelligent transportation system strategies like the Next OS, ATDM, and SIS. These strategies will help SANDAG coordinate the management of the Complete Corridor system across jurisdictions and operators that include capital and technology investments.

PRICING

The proposed Plan incorporates a variety of value pricing and user strategies as tools to improve mobility by encouraging changes in travel behaviors while generating revenue to address our aging infrastructure and expand travel options. Specifically, the proposed Plan explores a network of Managed Lanes, a mileage-based

road usage charge, a fee on the fares charged for rides provided by Transportation Network Companies, and further subsidization of transit fares. Strategies such as these are in different phases of planning, design, pilot, and deployment in different regions and are also being explored at the State and federal level. SANDAG will rely on coordination with the other MPOs in California along with Caltrans to integrate the selection of technology, collection methods, and account management to ensure a consistent experience for travelers. Meanwhile, the design of these strategies, such as the fee structure and distribution of revenue, should be specifically designed for the San Diego region's unique environment and priorities.

2.5.5 IMPLEMENTATION ACTIONS

The proposed Plan identifies the following priority actions that SANDAG will undertake to support implementation of the proposed Plan:

1. Apply the Social Equity Planning Framework and ensure that equity is considered throughout 2021 Regional Plan implementation.
2. Develop CMCPs to refine 2021 Regional Plan projects at the corridor level and qualify the region for future funding opportunities.
3. Update SANDAG policies, including the *TransNet* Ordinance, to reflect 2021 Regional Plan projects and priorities.
4. Evaluate the transition to free public transit and ~~D~~development a Value Pricing and User Fee Implementation Strategy.
5. Seek new local funding in addition to pursuing State and federal funding opportunities.
6. Advance Next OS by preparing technical and planning studies and initiating pilot opportunities.
7. Implement the RTIP and near-term projects.
8. Partner with local jurisdictions, tribal governments, agencies in Mexico, the military, and other agencies on collaborative efforts to implement the 2021 Regional Plan.
9. Expand regional programs and seek funding to fully support ~~on~~ low-carbon transportation options, roadway safety and maintenance, habitat conservation, and nature-based climate solutions.
10. Advance a data science program to better understand travel behavior and issues in the region, update travel demand modeling tools, and improve transparency and reporting on program effectiveness and project delivery.

Appendix B of the Regional Plan identifies near-term and continuing actions associated with each priority implementation action.

2.6 INTENDED USES OF THE EIR

The basic purposes of CEQA are to inform government decision makers and the public about potential significant environmental impacts of projects, identify ways the impacts can be reduced or avoided, prevent significant avoidable environmental damage through alternatives and mitigation, and disclose to the public the reason that decision makers approved a project that may result in unavoidable significant impacts.

The lead agency is required to consider the information in the EIR, along with any other relevant information, in making its decisions on the project approval. SANDAG is the lead agency for the proposed Plan and EIR.

Subsequent activities implementing the proposed Plan will be examined in light of this EIR to determine whether additional environmental documentation, if any, such as a Negative Declaration, Supplemental or Subsequent EIR, or Addendum, must be prepared. Where subsequent activities are "within the scope" of the Program EIR, because no subsequent environmental review would be required pursuant to CEQA Guidelines Section 15162, no further CEQA documentation would be required.

2.6.1 AGENCIES EXPECTED TO USE THE EIR

Lead agencies implementing second-tier land use or transportation projects can use this EIR as a first-tier EIR to focus project-specific CEQA documents on project-specific analyses and equally or more effective project-specific mitigation measures. These include but are not limited to cities, the County of San Diego, Caltrans, and transportation project sponsors

In addition, CEQA provides several opportunities for further CEQA streamlining for infill projects consistent with the SCS. These include opportunities are provided by:

- SB 375 (Public Resources Code Section 21155 et seq.)
- SB 226 of 2011 (Public Resources Code Section 15183.3 et seq.)
- SB 743 of 2013 (Public Resources Code Sections 21099 et seq. and Section 21155.4)

2.6.2 LIST OF PERMITS OR OTHER APPROVALS REQUIRED TO IMPLEMENT THE PROPOSED PLAN

Pursuant to 176(c) of the federal Clean Air Act (42 USC 7506(c)), SANDAG and USDOT, in consultation with EPA, must make a determination that the RTP and the RTIP conform to the SIP for air quality. See Appendix C of the proposed Plan for the conformity analysis.

2.6.3 ENVIRONMENTAL REVIEW AND CONSULTATION REQUIREMENTS

Preparation of the proposed Plan met both federal and SB 375 consultation requirements. See Appendices G, H, and I of the proposed Plan for documentation.

Federal consultation requirements (23 CFR Part 450.316) include (1) a process involving the MPO, State and local air quality planning agencies, State and local transportation agencies, EPA, and USDOT; and (2) a proactive public involvement process that provides opportunity for public review and comment by, at a minimum, providing reasonable public access to technical and policy information considered by the agency.

SB 375 (Government Code Section 65080) requires consultation with stakeholders, including affordable housing advocates, transportation advocates, neighborhood and community groups, environmental advocates, homebuilder representatives, broad-based business organization, landowners, commercial property interests, homeowners associations, congestion management agencies, transportation agencies, local agency formation commission, and members of city councils and boards of supervisors.

3 ENVIRONMENTAL SETTING

3.1 PHYSICAL CHARACTERISTICS OF THE SAN DIEGO REGION

Located in the southwest corner of the United States, the San Diego region comprises approximately 4,200 square miles and three general physiographic subregions: Southern California coast, Southern California mountains and valleys, and Colorado desert (McNab et al. 2005). To the north, the region is bordered by Orange and Riverside counties, although it is largely separated from Orange County by Camp Pendleton. To the south is the U.S. border with Mexico. The Pacific Ocean forms a natural border to the west, and the region shares a border with Imperial County to the east.

The Southern California coast subregion ranges in elevation from sea level to approximately 2,900 feet above mean sea level (AMSL). Although much of the coastal plain has been developed for commercial, industrial, recreational, and residential uses, the coastal plain also contains state parks, beaches, wetlands, and ecological reserves. Marine terraces step up the coastal plain west to east toward the inland foothills. The Southern California coast subregion also contains foothills and mesas with river valleys and narrow canyons. Several rivers run from the mountain area and through the Southern California coast subregion, flowing into intermittent drainages or the Pacific Ocean. The most intensive urban development, including population, housing, and employment within incorporated and unincorporated communities, is found in the Southern California coast subregion where topography and mild coastal climatic conditions are favorable.

Elevations in the Southern California mountains and valleys subregion range from 100 to 6,500 feet AMSL. The mountains are generally steep and covered with conifer and broadleaf trees, granitic boulders, meadows, and chaparral vegetation. The eastern portion of the San Diego region is the Colorado desert subregion. Elevations range from sea level to 3,400 feet AMSL, and the terrain includes mountains, alluvial fans, and desert floor. The mountain and desert subregions are sparsely populated in scattered towns as part of the unincorporated area of San Diego County. Much of the Colorado desert subregion is part of the Anza-Borrego State Park, the largest state park in California.

The climate of the San Diego region varies by location. Historically, temperatures in the region were typically moderate on the coast, with an average high temperature of 69.9 degrees Fahrenheit (°F) and an average low temperature of 56.5°F. Average monthly temperatures rarely exceeded 75°F, and the average annual precipitation on the coast was 10.13 inches (WRCC 2016). The historical average high and low temperatures in the desert subregion (as measured at the unincorporated town of Borrego Springs) were 88.3°F and 63.6°F, respectively. Average monthly temperatures in the desert subregion typically exceeded 100°F in summer months, and the average annual precipitation in the desert subregion was 5.31 inches (U.S. Climate Data 2019).

Climate change has already impacted the San Diego region, and those impacts are expected to continue to be seen in regional temperatures, heat waves, precipitation, and sea-level rise (see Appendix C). The annual average temperature for the San Diego region is projected to increase 4.8°F by 2050 while coastal areas may be 0.9°F cooler than inland areas by 2050 (Kalansky et al. 2018). Climate change is projected to bring increases in heat wave frequency, intensity, and duration, with the length of the heat wave increasing by 20–50 percent under a 6°F annual average temperature increase (Kalansky et al. 2018). The San Diego region is projected to experience up to 15 extreme heat days by 2050; the region currently experiences an average of 2 extreme heat days per year, so this is a more than seven-fold increase (CEP and SDF 2015). Regional precipitation will remain highly variable but will contain more contrast, with wetter winters, drier springs and autumns, more intense precipitation events,

and more frequent and severe droughts due to climate change (Kalansky et al. 2018). The San Diego region is projected to experience 16 percent fewer rainy days and 8 percent more rainfall during the biggest rainstorms by 2050 (CEP and SDF 2015). Sea levels in the San Diego region have already risen about 0.6 foot over the last century and are expected to rise even faster in the future due to projected climate change impacts (Kalansky et al. 2018).

3.2 RARE AND UNIQUE ENVIRONMENTAL RESOURCES

Due to its diverse topography, geological conditions, and moderate climate, the San Diego region contains several rare and unique ecological and biological resources. The region encompasses a variety of habitats, such as coastal sage scrub, chaparral, grassland, riparian, woodlands, forest, and desert. Several habitats and species in the region are considered sensitive by state and federal agencies, local jurisdictions, and conservation organizations. In fact, the San Diego region is considered a biological "hot spot" for biodiversity and species endangerments, as many unique and endangered species are found only in this region.

Along the coast, the Torrey Pines State Natural Reserve is home to the Torrey pine, the rarest pine in North America. Coastal sage scrub is another unique vegetation community. An important habitat for many species, coastal sage scrub is found from the coast to the mountain regions. As a wetland, the riparian vegetation community (scrub, woodland, and forest) found in the region is one of the most sensitive habitats in California. The San Diego Bay is another important natural resource in the region.

3.3 EXISTING LAND USE AND DEVELOPMENT PATTERNS

This section describes existing land use and development patterns as of 2016, the year in which the Notice of Preparation (NOP) for this Environmental Impact Report (EIR) was published. Urban development is primarily within the western third of the region. Development concentrations are mostly centered along the coast with areas of urbanization branching eastward. This land use pattern is shown in Figure 4.11-1 in Section 4.11, *Land Use*. More than 50 percent of the total land area in the region is not available for urban development, including public lands, dedicated parks and open space, lands constrained for environmental reasons, and military bases. Of the 2,727,138 total acres in San Diego County, 1,521,844 acres are constrained, 670,374 acres are developed, and 534,920 are undeveloped.

Many incorporated cities, both large and small in size and population, are located along the coast and tend to have fairly high density relative to other portions of the region. Historically, development has centered along the coastal areas due to desirability of the location, access to infrastructure and transportation options, and access to employment and commercial centers, among other factors. As shown in Figure 4.11-1 land uses in the western portion of the region generally include residential development, commercial and office use, industrial uses, public and transportation facilities, and interspersed areas of parks and open space. Many of the region's military facilities are also in proximity to the coast.

The cities and portions of the unincorporated county that are situated in more inland and eastern locations tend to have lower-density development and are typically located along major roadways. Historically, many inland locations have focused on maintaining more rural and nonurban characteristics. Land uses in the eastern portion of the region include some centers of urban development, typically along transportation corridors, including State Routes (SR) 78, SR 79, and SR 94 with rural, agricultural, commercial, and industrial uses. However, the majority of the land remains as undeveloped and open space parks with some agricultural lands throughout.

3.4 EXISTING TRANSPORTATION NETWORK

This section describes the existing transportation network as of 2016, the year in which the NOP for this EIR was published. The existing transportation network consists of freeways, highways, managed lanes, a toll road, regional arterials, local streets and roads, light rail systems, heavy rail, rapid bus service, local bus service, bikeways, commercial and general aviation facilities, seaport facilities, and ports of entry at the United States/Mexico border (Figures 4.16-1 through 4.16-3 in Section 4.16, *Transportation*). These facilities serve the region's 18 cities and the County's unincorporated areas, as well as interregional and international commuting.

The largest proportion of major transportation facilities is located in the western third of the region to best serve the largest and fastest growing population areas. This includes the following major interstate highways and state highway routes:

- Interstate 5 (I-5)
- Interstate 8 (I-8)
- Interstate 15 (I-15)
- Interstate 805 (I-805)
- State Route 15 (SR 15)
- State Route 52 (SR 52)
- State Route 54 (SR 54)
- State Route 56 (SR 56)
- State Route 67 (SR 67)
- State Route 75 (SR 75)
- State Route 76 (SR 76)
- State Route 78 (SR 78)
- State Route 79 (SR 79)
- State Route 94 (SR 94)
- State Route 125 (SR 125)
- State Route 163 (SR 163)
- State Route 188 (SR 188)
- State Route 282 (SR 282)
- State Route 905 (SR 905)

The San Diego Metropolitan Transit System (MTS) operates the San Diego Trolley. The existing San Diego Trolley network consists of electrified light rail vehicles operating on the Blue, Orange, and Green Lines. The Blue Line operates between America Plaza in Downtown San Diego and San Ysidro at the international border with Mexico via National City and Chula Vista. Construction is currently under way to extend the Blue Line north to the University City community, also referred to as the Mid-Coast Corridor, and will serve major activity centers such as the University of California San Diego and Westfield University Town Center. Service is anticipated to begin in November 2021. The Orange Line also terminates at America Plaza, with service extending east to El Cajon via southeastern San Diego, Lemon Grove, and La Mesa. The Green Line operates from 12th Street and Imperial Avenue in Downtown San Diego north to Old Town along the bayside, then east to Santee via Mission Valley and San Diego State University.

In North County, the North County Transit District (NCTD) manages the SPRINTER light rail system, which operates diesel-powered light rail vehicles along a 22-mile east-west route serving 15 stations connecting Oceanside, Vista, San Marcos, and Escondido generally along SR 78. NCTD also operates the COASTER commuter rail service along the San Diego region's portion of the Los Angeles–San Diego–San Luis Obispo (LOSSAN) rail corridor from Oceanside to Downtown San Diego.

Amtrak operates the intercity Pacific Surfliner on the LOSSAN corridor connecting San Diego to the rest of the Southern California and nationwide rail system. Metrolink, a regional commuter and passenger train system that operates in Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties, connects with the COASTER and SPRINTER systems via service to the Oceanside Transit Center. There also are three rail freight operators, the Burlington Northern and Santa Fe (BNSF), Pacific Sun Railroad, and the San Diego and Imperial Valley Railroad (SDIV).

Commuter and local bus service is provided throughout the region, including high-volume service to the North County, central, and south bay/border areas. In addition, regional corridor bikeways are primarily aligned in conjunction with major transportation corridors and are supported by an extensive feeder network and local streets.

The movement of goods in the San Diego region involves intermodal systems of air cargo, border crossings, maritime, pipeline, rail, and roadways/truckways. Situated between major production, trade, and population centers, the San Diego region possesses a wide array of transportation and infrastructure assets. The existing transportation system includes interstate highways and state highways, a Class I railroad, a short line railroad, airport cargo systems, the Port of San Diego, and three international border crossings: San Ysidro, Otay Mesa, and Tecate.

Ocean cargo and cruise ship facilities are located on San Diego Bay, providing facilities necessary for the transfer of goods to and from the region via cargo vessels and for the cruise industry. Maritime commerce is carried out at two marine terminals located on San Diego Bay: the 10th Avenue Marine Terminal in the City of San Diego and the National City Marine Terminal at 24th Street. Ferry service operates between Downtown San Diego and Coronado.

The San Diego County Airport System includes 12 public use airports in the San Diego region as well as four military airports/airfields. Tijuana International Airport is located directly south of the U.S.-Mexico border. SDIA, McClellan-Palomar, and Tijuana International Airport (TIA) accommodate commercial, general aviation, and corporate services. Brown Field Municipal, Gillespie Field, Montgomery Field, and Ramona accommodate general aviation and corporate services. The remaining airports accommodate general aviation only, and include Oceanside Airport, Fallbrook Community Airpark, Borrego Valley Airport, Ocotillo Airport, Agua Caliente Airport, and Jacumba Airport. Military airports include Marine Corps Base Camp Pendleton, Marine Corps Air Station Miramar, Naval Air Station North Island, and Naval Outlying Landing Field Imperial Beach. In general, the San Diego County Regional Airport Authority (SDCRAA) is the government entity with jurisdiction over airport planning. In addition, SDCRAA operates SDIA. SANDAG and SDCRAA work together to address long-term ground access improvements to SDIA.

The existing bicycle network in the San Diego region consists of a combination of standard bicycle facilities and regional corridors, including (as of 2021) about 189 miles of Class I bike paths, 1,145 miles of Class II bike lanes, 363 miles of Class III bike routes, and 13 miles of Class IV cycle tracks (SANDAG 2021). In addition, the San Diego region includes 60 miles of the California Coastal Trail (CCT), an interconnected series of coastal hiking, biking, and equestrian trails stretching 1,200 miles along the California coastline from Oregon to Mexico (California Coastal Conservancy 2021).

Chapter 4, *Environmental Impact Analysis*, provides additional, more specific information relating to the existing environmental setting in the San Diego region pertaining to aesthetics and visual resources; agriculture and forestry resources; air quality; biological resources; cultural resources; energy; geology, soils, and paleontological resources; greenhouse gas emissions; hazards and hazardous materials; hydrology and

water quality; land use; noise and vibration; population and housing; public services and utilities; transportation; tribal cultural resources; wildfire; and water supply.

3.5 PLAN CONSISTENCY

CEQA Guidelines Section 15125(d) requires an EIR to discuss any inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans. Land use authority is vested in 18 incorporated cities and the unincorporated County. Consistency of the proposed Plan with these agencies' land use plans (general plans and subregional plans such as specific plans) is discussed in Section 4.11. In addition, consistency of the proposed Plan with applicable regional plans prepared for specific resources is discussed in other Chapter 4 subsections, which analyze the impacts on specific resources.

4 ENVIRONMENTAL IMPACT ANALYSIS APPROACH

This chapter discusses the environmental impacts of implementing the proposed Plan and identifies mitigation measures to reduce impacts found to be significant. This introductory section describes the resource areas analyzed and the general impact analysis methodology employed.

RESOURCE AREAS ANALYZED

Consistent with the CEQA Guidelines and public scoping input discussed in Chapter 1, *Introduction*, the resource areas analyzed in this EIR because they may have significant impacts are as follows:

- Aesthetics and Visual Resources
- Agricultural and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology, Soils, and Paleontological Resources
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Mineral Resources
- Noise and Vibration
- Population and Housing
- Public Services and Utilities
- Transportation
- Tribal Cultural Resources
- Water Supply
- Wildfire

ANALYSIS METHODOLOGY

As discussed in Chapter 1, this is a Program EIR, which may be prepared for a series of related actions that can be characterized as one project (CEQA Guidelines Section 15168). The degree of specificity in an EIR corresponds to the degree of specificity of the underlying activity being evaluated (CEQA Guidelines Section 15146). This EIR analyzes impacts of the proposed Plan at the same level of detail as the proposed Plan. The EIR provides a foundation for second-tier CEQA documents for subsequent projects, but does not analyze the project-specific impacts of individual projects. Project-specific and site-specific details of subsequent transportation and land use projects will vary widely. When a first-tier Program EIR is prepared, "leaving project-specific details to subsequent EIRs when specific projects are considered" is a proper approach to CEQA tiering (In re Bay Delta [2008] 43 Cal. 4th 1143, 1174).

Also, the planning horizon of the proposed Plan is 2050. The programmatic and long-term nature of the proposed Plan necessitates a general and at times qualitative approach to the evaluation of impacts. The EIR analyzes impacts for the two main physical components of the proposed Plan: regional growth and land use

change, and transportation network improvements and programs[1]. It also analyzes the combined impacts of these components.

SANDAG is required to update the Regional Plan every 4 years, in collaboration with the 18 cities and County of San Diego, along with regional, state, and federal partners. The 2021 Regional Plan is unique, as it was developed over 6 years rather than 4 years. In October 2019, California Assembly Bill (AB) 1730 (Gonzalez) was signed into law, authorizing a 2-year extension for the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) for the San Diego region and deeming the 2015 Regional Plan, its SCS, and Final EIR valid for state compliance, funding eligibility, and other purposes through 2021.

Due to this extended timeframe, the 2021 Regional Plan has a baseline of 2016, which is two years older than would be typical in past Regional Plan EIRs. In general, physical conditions as they existed in 2016 are used as the baseline for the impact analysis of this EIR, corresponding with the release of the NOP on November 14, 2016 and the start of EIR preparation. For a few significance criteria, more recent data are used when available to better represent existing conditions. For a few other significance criteria, when 2016 information was not available, older information was used, with an explanation of why the information is representative of 2016 existing conditions. The impact analysis involves comparison of anticipated future physical conditions under implementation of the proposed Plan to the baseline conditions for each resource area. The analysis includes not only future conditions in the 2050 long-term horizon year of the proposed Plan, but also the interim years of 2025 and 2035.

Each resource area section includes the following:

Existing Conditions, consistent with CEQA Guidelines Section 15125(a), are described in the EIR and serve as the baseline physical conditions for the analysis of impacts. As noted above, unless otherwise stated, the *Existing Conditions* sections of the EIR describe conditions existing in 2016. This section also describes the anticipated effects from climate change for each resource area, if any.

Regulatory Setting provides a summary of the federal, state, and local laws, regulations, plans, or policies that are relevant to each resource area and its significance criteria.

Significance Criteria are identifiable quantitative, qualitative, or performance levels used for each resource area to determine whether environmental impacts are significant. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the checklist questions in Appendix G of the CEQA Guidelines. In some cases, the EIR has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop criteria that reflect the programmatic level of the impact analysis and the unique nature of the proposed Plan or local conditions.

[1] The activity-based model (ABM 2+) that SANDAG used to develop the proposed Plan is continually updated and so includes data reflecting a number of transportation projects that opened to traffic or started service between 2016 and the present. As a result, impacts analyzed in this EIR include impacts of some transportation projects that are not newly proposed in the 2021 Regional Plan, but which were constructed or became operational between 2016 and 2021. As a result, the impacts of transportation network improvements analyzed in this EIR are conservative and include impacts beyond those strictly attributable to the new projects reflected in Appendix A to the 2021 Regional Plan and this EIR's project description.

Analysis Methodology describes the methods used to evaluate the impact for each significance criterion and explains how a significant impact is defined for each significance criterion. For some resource areas, technical appendices have been prepared that present more detail on methodology, assumptions, data sheets, and/or results.

Impact Analysis presents scientific or factual data for the cause-and-effect relationship between the proposed Plan and the forecasted changes in baseline physical environmental conditions. The magnitude, duration, extent, frequency, range, or other parameters of an impact may be described to determine whether impacts are significant; all direct effects and reasonably foreseeable indirect effects are considered, with due consideration to both short-term and long-term impacts. Impacts are analyzed for 2025, 2035, and 2050 for the reasons described above.

The EIR provides quantitative analysis of the environmental impacts of the proposed Plan where possible or meaningful. For example, quantitative analysis is provided in the following resource area sections: agricultural and forestry resources, air quality, biological resources, energy, greenhouse gas emissions, mineral resources, population and housing, public services (recreation), transportation, water supply, and wildfire. However, not all the proposed Plan's impacts can meaningfully be analyzed quantitatively through the year 2050. The proposed Plan includes programs related to emerging technologies, transportation system management, and transportation demand management. These programs do not involve additional construction activities that could affect sensitive resources that are not already included as part of a transportation network improvement. Therefore, no GIS-based impact analysis is completed for these programs.

Where quantitative analysis of an impact is not possible or meaningful, qualitative analysis is provided. The EIR provides sufficient information about the proposed Plan's environmental impacts "in light of what is reasonably feasible." (CEQA Guidelines Section 15151.) For example, indirect impacts that may occur on resources in proximity to areas experiencing regional growth and land use change and/or transportation network improvements cannot be quantified because they may be project-specific and are not always foreseeable. They are, therefore, qualitatively analyzed on a broad scale

It is also important to note that climate change may affect most resource areas in the future, and the proposed Plan may exacerbate climate change effects. Thus, the impact analysis evaluates whether the proposed Plan would magnify a climate change impact (e.g., creating more housing development in high wildfire risk zones).

A cumulative impact analysis is provided in Chapter 5, which analyzes whether a significant cumulative impact is created when impacts of the proposed Plan are added to the impacts of one or more related projects, and whether the proposed Plan's contribution to this impact is cumulatively considerable (CEQA Guidelines Section 15130). Cumulative impacts are analyzed for the same resource areas analyzed in Chapter 4.

Mitigation Measures are feasible actions intended to avoid or substantially lessen significant impacts identified in the *Impact Analysis*. Mitigation Measures are provided only for those significance criteria where significant impacts have been identified.

The EIR includes three broad types of mitigation measures: (1) plan- and policy-level mitigation measures assigned to SANDAG; (2) mitigation measures for transportation network improvements and programs, assigned to SANDAG and other transportation project sponsors; and (3) mitigation measures for development projects implementing regional growth and land use changes, which local jurisdictions implement.

The SANDAG Board of Directors has discretion to adopt or reject plan and policy level mitigation measures recommended in the EIR (as well as the other two types). This decision will be reflected in findings made by the Board at the time of Project approval. Plan or policy level mitigation measures that are accepted will be made formal parts of the proposed Plan and monitored to help ensure their implementation.

While the EIR provides as much detail as needed in the mitigation measures to evaluate their ability to avoid or substantially lessen impacts, some flexibility must be maintained to present mitigation approaches for impacts occurring under different circumstances. Many of the mitigation measures include lists of mitigation actions that can be implemented in connection with individual future transportation and development projects that would implement the proposed Plan; development projects would be undertaken under the land use authority of local governments. These individual future projects will occur over a wide and diverse geographic scope over the 30-year time span addressed in the proposed Plan. Some will require approvals from multiple public agencies, each with different legal, regulatory, or other authority relevant to the proposed Plan. Because the nature of individual future projects, resources, and legal authority of the approving agency or agencies, physical circumstances of the project, and local policy considerations for all future projects implementing the proposed Plan will vary widely, the mitigation actions included, while generally feasible for many projects, may not be feasible for specific projects. In each case, the lead agency (and any responsible agencies) for an individual project will have to determine which mitigation actions are specifically applicable to the project, and the degree to which the recommended mitigation actions can feasibly be implemented based on project-specific circumstances.

Laws and regulations that are applied routinely to similar projects are generally considered in the impact analysis and not repeated as mitigation. However, some mitigation measures do describe specific impact-reducing actions that would be taken to achieve compliance with laws and regulations. In addition, many policies and programs already included in the proposed Plan would have the effect of reducing environmental effects that might otherwise occur from regional growth and land use change, and transportation network improvements and programs. The effects of these intrinsic elements of the proposed Plan are accounted for in the impact analysis. These intrinsic measures may be identified in the impact analysis text; however, they are not considered "mitigation measures" for purposes of the EIR.

SANDAG is responsible for implementing those mitigation measures within its responsibility, jurisdiction, and statutory authority. Mitigation can also include measures that are within the responsibility and jurisdiction of another public agency (CEQA Guidelines Section 15091 [a][2]). In many instances, mitigation measures included in this EIR that would avoid or substantially lessen significant impacts of the proposed Plan fall under the responsibility and jurisdiction of other implementation agencies, such as cities, the County, Caltrans, public transit agencies, or other special districts. Because other project agencies would be responsible for certain mitigation measures identified in this EIR, SANDAG in its CEQA findings may find that those measures, if feasible, can and should be adopted by those other agencies (CEQA Guidelines Section 15091(a)(2)). Details regarding responsibilities for mitigation measure implementation will be provided in a separate mitigation monitoring and reporting program (MMRP) that the SANDAG Board of Directors will consider for approval in conjunction with approval of the proposed Plan.

For second-tier transportation projects, SANDAG will implement mitigation measures for those projects that SANDAG directly approves or carries out as the CEQA lead agency or where discretionary TransNet funds are used. Where SANDAG acts as a pass-through agency for funding, it is the funding agency's responsibility to place conditions on grant funding. When using discretionary TransNet funds, which support TransNet grant

programs funding local agency capital projects, SANDAG will require as a grant condition the implementation of all feasible EIR mitigation measures that are applicable to the project type being funded.

Significance After Mitigation describes the effect of the mitigation measure(s) on the significant impact(s) and determines whether the mitigation measure(s) will reduce the impact to less than significant, or whether the impact will remain significant. Impacts that remain significant after feasible mitigation measures are applied are identified as "significant and unavoidable impacts." For some impacts, infeasible mitigation measures are also discussed, with explanations of why they are infeasible; this discussion is provided for informational purposes only and is not required by CEQA.

As mentioned previously, with respect to land use changes implemented by local jurisdictions and transportation network improvements implemented by other transportation project sponsors, SANDAG has no authority to require implementing agencies to implement or enforce project-specific mitigation measures. In addition, some programmatic mitigation may not be feasible or effective for particular projects based on project- or site-specific circumstances. This results in many significant impacts being significant and unavoidable.

In each resource area section, this EIR identifies mitigation measures that generally are performance standards–based, which SANDAG shall and other implementing agencies "can and should" comply with in mitigating project-specific impacts. Where applicable, SANDAG then identifies examples of project-level mitigation measures that may be required by lead agencies to meet performance standards. In project-specific CEQA reviews, lead agencies may also identify other comparable measures capable of reducing impacts below the specified threshold. SANDAG cannot require other lead agencies to adopt mitigation, and it is ultimately the responsibility of the lead agency to determine and adopt project-specific mitigation as appropriate and feasible for each individual project. As a result, this EIR concludes significant and unavoidable for many impacts where SANDAG does not have authority to implement or enforce project-specific mitigation measures, or where State or local action might be needed to reduce impacts to less-than-significant levels.

4.1 AESTHETICS AND VISUAL RESOURCES

This section evaluates the aesthetics and visual resources impacts of the proposed Plan.

4.1.1 EXISTING CONDITIONS

The following discussion provides information on the character of the existing visual landscape, including the visual character of the region, scenic vistas and visual resources such as natural landforms, scenic highways, light, glare, and dark skies.

REGIONAL CHARACTER

The San Diego region is a visually diverse landscape rich in natural open space, topographic resources, scenic highways, scenic vistas, and other distinct aesthetic resources. Its adjacency to the Pacific Ocean also contributes to the natural setting of the San Diego region. The topography contributes greatly to the overall character and quality of the existing visual setting. In general terms, the San Diego region is characterized by four physiographic areas: the low-lying coastal plain, foothills, mountains, and lowlands of the desert. The visual character of each is described briefly below. The coastal plain ranges in elevation from sea level to approximately 600 feet above mean sea level (AMSL) and includes beaches; bays; shoreline; coastal canyons; and the many rivers, streams, and other watercourses that drain inland areas, eventually reaching the coastal environment and waters. The coastal plain provides expansive views of scenic resources in all directions, with the coastline visible from regional transportation facilities including the Los Angeles–San Diego–San Luis Obispo (LOSSAN) rail corridor and Interstate (I-) 5. Much of the coastal plain is developed with urban land uses and generally includes a dense development pattern consisting of a mix of single- and multifamily development on varying-sized lots with supporting commercial uses, including office space and neighborhood-serving or regional retail establishments, along major corridors. The circulation systems within these coastal communities are essentially based around a grid system with more curvilinear street patterns occurring along the hillsides. Agricultural uses within the coastal area include row crops, field flowers, and greenhouses.

The foothills of the San Diego region range in elevation from 600 to 2,000 feet AMSL and are characterized by rolling to hilly uplands that contain frequent narrow, winding valleys. This area is traversed by several rivers, as well as a number of intermittent drainages. Several side canyons have incised the coastal plan and created major drainages that generally flow westward toward the coast. Major rivers within the San Diego region include the Santa Margarita, San Luis Rey, San Dieguito, San Diego, Sweetwater, Otay, and Tijuana Rivers. Major coastal waterbodies include Buena Vista Lagoon, Agua Hedionda Lagoon, Batiquitos Lagoon, San Elijo Lagoon, San Dieguito Lagoon, Los Peñasquitos Lagoon, Mission Bay, San Diego Bay, Tijuana River Estuary, and the Pacific Ocean. Playas/inundation areas/washes include areas surrounding Lake Henshaw, Lake Cuyamaca, Moreno Reservoir, and Lake Hodges. The foothills are also developed with various suburban to semi-rural development land uses. Most contain a mix of single-family and low-scale multifamily suburban style development as well as some commercial and employment uses intended to support the residential uses. Agriculture consists of citrus and avocado orchards as well as row crops.

The mountain region features steep-sided mountains that are typically covered with granitic boulders. Lower slopes feature chaparral vegetation. Higher elevations are host to oak woodlands and coniferous forest. Elevations range from 2,000 to 6,000 feet AMSL. The mountain areas are generally undeveloped with low density, rural communities scattered throughout such as Alpine, Pine Valley, Campo, Ramona, and Julian.

The eastern portion of the San Diego region is within the desert zone. Elevations range from sea level to 3,000 feet AMSL and the terrain includes mountains, alluvial fans, and desert floor. The majority of this region is part of the Anza-Borrego Desert State Park. The desert region is generally undeveloped and sparsely populated in scattered towns such as the unincorporated community of Borrego Springs. The desert region provides expansive views of the surrounding area, which is characterized by dramatic landforms and native desert habitats.

PANORAMIC VIEWS

The varied topography and wide range of visual features found throughout the San Diego region provide for many areas containing panoramic views. Viewsheds include views of mountains, beaches, the Pacific Ocean, bays, lagoons, canyons, and valleys, as well as human-made features such as city skylines, rural communities, parks, and golf courses.

SIGNIFICANT LANDSCAPE FEATURES

The coastal plain, foothills, mountains, and desert regions each contain numerous scenic resources and significant landscape features that contribute to the San Diego region's overall scenic quality. Major scenic resources within the coastal areas include views of the Pacific Ocean, beaches, bays, lagoons, and harbors. Notable features include San Diego Bay, Mission Bay Park, Los Peñasquitos Lagoon, Batiquitos Lagoon, Agua Hedionda Lagoon, Buena Vista Lagoon, San Elijo Lagoon, and Oceanside Harbor. Coastal parks, including Border Field State Park, the Tijuana estuary, Silver Strand State Beach, and Torrey Pines State Reserve and Beach, and prominent land and water features, such as Cabrillo National Monument on Point Loma, Sunset Cliffs, La Jolla Cove, Soledad Mountain, and the offshore Coronado Islands, are also visual resources along the coast.

Within the foothills, the prominent visual resources include rivers, lakes, open bodies of water, and parks such as the Otay River, Sweetwater River, San Diego River, Upper and Lower Otay Lakes, Sweetwater Reservoir, Lake Hodges, San Vicente Reservoir, Mission Trails Regional Park, Santee Lakes Regional Park, Tecolote Canyon, Los Peñasquitos Canyon Preserve, Old Town State Historic Park, and Presidio Park. Within the mountain region, scenic resources include large park areas such as the Cleveland National Forest, Agua Tibia Wilderness Area, San Mateo Canyon Wilderness, Santa Rosa Mountains State Wilderness, Palomar Mountain State Park, and Cuyamaca Rancho State Park, as well as large water bodies such as El Capitan Reservoir, Barrett Lake, Lake Morena, and Lake Cuyamaca.

The desert region is primarily located within Anza-Borrego Desert State Park, which is the largest of the California State Parks. The desert region includes expansive scenic views, dramatic landforms, desert valleys, and native desert habitat. The wide range of visual features in the desert region helps to define communities, provides visual relief from urban development, and offers recreational opportunities.

In addition to the visual resources described above, there are numerous golf courses, city and community parks, and large primarily undeveloped landholdings that contribute to the scenic quality of the San Diego region.

OPEN SPACE AND PROTECTED AREAS

A significant part of the San Diego region's visual character can be attributed to the large amount of open space and protected areas (see Figure 4.15-1 in Section 4.15, *Public Services and Utilities*). Approximately 45 percent of the lands in the San Diego region have been conserved as open space or parks (San Diego Foundation 2010). These lands include state and regional parks, habitat conservation areas, resource conservation areas,

U.S. Forest Service lands, and rural open space. The San Diego region also contains large areas of undeveloped military land at Marine Core Base Camp Pendleton and Marine Corps Air Station Miramar, which are not accessible to the general public but do contribute to the overall undeveloped nature of those portions of the San Diego region. The western third of the San Diego region contains the bulk of the region's population and urban areas, although open spaces are interspersed within this area as well.

STATE SCENIC HIGHWAYS

The San Diego region includes several officially designated scenic highways protected by the California Scenic Highway Program, administered by the California Department of Transportation (Caltrans). Designated scenic highways are located in areas of outstanding natural beauty and are provided with special conservation treatment to keep the natural views protected. The San Diego region also contains several highways identified by the program as eligible scenic highways, meaning that the highway is considered a scenic resource, but the local jurisdiction has not adopted a scenic corridor protection program or applied to Caltrans for official designation. The highways in the San Diego region officially designated or identified as eligible scenic highways by Caltrans are listed in Table 4.1-1 and shown in Figure 4.1-1.

Table 4.1-1
Caltrans Designated or Eligible Scenic Highways in the San Diego Region

Officially Designated	
SR 52	From near Santo Road to near Mast Boulevard
SR 75	San Diego-Coronado Bay Bridge and the Silver Strand extending from Avenida del Sol in Coronado south to the Imperial Beach city limit
SR 78	From the west to the east boundary of Anza Borrego State Park
SR 163	From the north to the south boundary of Balboa Park
SR 125	From I-8 south to SR 94
Eligible for Scenic Designation	
I-5	From the international border near Tijuana to SR 75 (Palm Avenue) at the south end of San Diego Bay and from San Diego opposite Coronado to SR 74 near San Juan Capistrano (Orange County)
I-8	From Sunset Cliffs Boulevard to SR 98 near Coyote Wells (Imperial County).
I-15	From SR 76 near San Luis Rey to SR 91 near Corona (Riverside County).
SR 52	From I-5 east of La Jolla to SR 67 near Santee
SR 75	From I-5 in Palm City/Nestor to 9th Street in Imperial Beach
SR 76	From I-5 near Oceanside to SR 79 near Lake Henshaw
SR 78	From SR 79 near Santa Ysabel to SR 86 passing Julian
SR 79	From I-8 near Descanso to SR 78 near Julian and from SR 78 near Santa Ysabel to SR 371 near Aguanga (Riverside County)
SR 94	From SR 125 near Spring Valley to I-8 west of Jacumba
SR 163	From Ash Street to I-8
SR 209	From Point Loma to I-5

Source: Caltrans 2018a.
SR = State Route; I- = Interstate.

OTHER SCENIC ROUTES

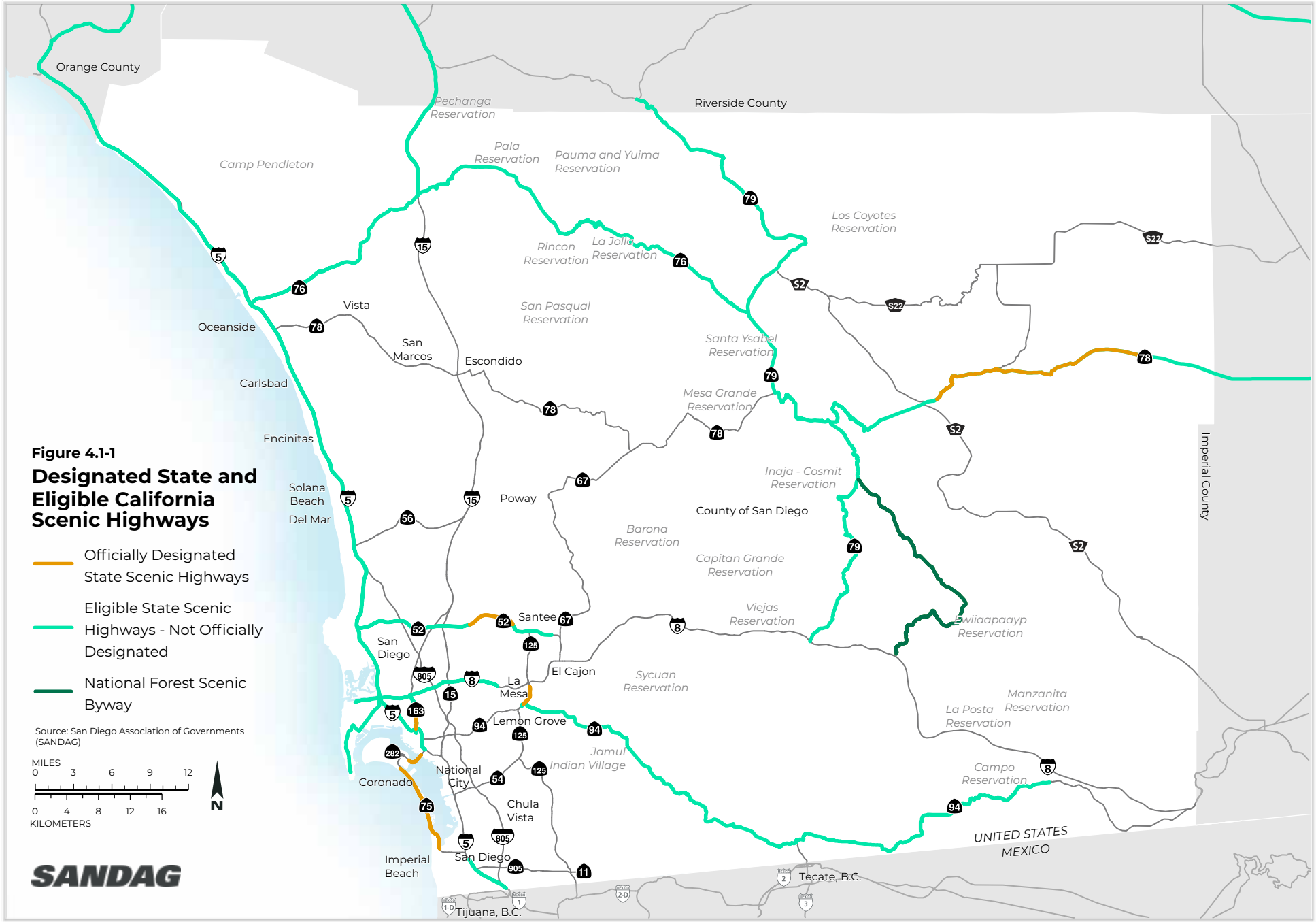
In addition to the state scenic highways, the County of San Diego General Plan Conservation and Open Space Element (County of San Diego 2011) identifies other scenic roadways and highways worthy of protection in the unincorporated County. A list of these highway segments is found in Table 4.1-2.

Table 4.1-2
County Scenic Highway System

Route	Segment
SR 78	Wynola Road east to Imperial County line (excluding portion in Anza-Borrego Desert State Park)
SR 125	SR 94 to I-8
I-5	Oceanside city limits north to Orange County line
I-8	El Cajon city limits to SR 79
I-15	Escondido City limits north to Riverside County line
SR 67	Santee city limits to SR 78 (excluding portion in City of Poway)
SR 76	Oceanside city limits east to I-15
SR 76	I-15 east to SR 79
Bear Valley Parkway and SR 78	Escondido city limits southwest to Via Rancho Parkway
SR 78	Via Rancho Parkway to SR 79, except portions within the City of San Diego
SR 79	Riverside County line to SR 76
SR 94	SR 125 to I-8
SR 188 (Tecate Road)	U.S./Mexico border north to SR 94
Sunrise Highway (S1)	Old Highway 80 to SR 79 through the Cleveland National Forest
Old Overland Stage Route (S-2)	Imperial County line north to SR 78
Lilac Road and Valley Center Road (S6)	SR 76 to SR 76
San Felipe Road, Montezuma Valley Road, Pal Canyon Road, Peg Leg Road, and Borrego Salton Seaway (S-22)	SR 79 east to Imperial County line
Avocado Boulevard	SR 94 to El Cajon city limits
Bonita, San Miguel, Guajolote, and Sweetwater River Road	I 805 North to SR 94 (excluding portion within City of Chula Vista)
Buckman Springs Road	Lake Morena Drive to SR 94
Camino del Rey west to Lilac Road	Oceanside city limits east to Vista Way
Dehesa Road	El Cajon city limits to Tavern Road
Elfin Forest Road/Harmony Grove Road	San Marcos city limits to Escondido city limits
El Monte Road	El Capitan Reservoir to Lake Jennings Park Road
Fuerte Drive	I-8 to Chase Avenue
Gird, Reche, Live Oak Park, and Mission Roads	SR 76 north and east to I-15
Harbison Canyon Road	Arnold Way to Dehesa Road

Route	Segment
Highland Valley Road	San Diego city limits to SR 67
Honey Springs Road	SR 94 north to Lyons Valley Road
Japatul Road	Lyons Valley Road to I-8
La Cresta Road	Greenfield Drive to La Cresta Boulevard
Lake Wohlford Road	Valley Center Road east (Escondido city limits) to Valley Center Road (excluding portion within the City of Escondido)
Lake Morena Drive	Buckman Springs Road north to Morena Lake
Lyons Valley Road	SR 94 to Cleveland National Forest
Mission and Green Canyon Roads	SR 76 north and east to Reche Road
Mountain View Road/Francis Drive	Boulevard to Harbison Canyon Road
Oak Drive	Lake Morena Drive north to Buckman Springs Road
Old Highway 80	SR 79 (Pine Valley) to I-8 (Jacumba)
Olive Hill Road	SR 76 to planning area boundary
Otay Lakes Road	Chula Vista city limits to SR 94
Potrero Valley Road	SR 94 to Potrero County Park
San Vicente and Ramona Oaks Road	SR 78 to Cleveland National Forest

County of San Diego 2011.


Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Sycuan Reservation
Jamul Indian Village
La Posta Reservation
Manzanita Reservation
Campo Reservation
Ewiiaapaayp Reservation
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
San Diego
Imperial Beach
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.1-1
Designated State and Eligible California Scenic Highways
Officially Designated State Scenic Highways
Eligible State Scenic Highways - Not Officially Designated
National Forest Scenic Byway
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Sunrise Highway is a U.S. Forest Service Scenic Highway designated under the National Scenic Byway (NSB) Program. Sunrise Highway is located between the Cuyamaca Reservoir and Laguna Junction and provides views of mountain meadows, forests, and the Anza-Borrego Desert. It is the only nationally designated roadway in the San Diego region.

The City of San Diego also maintains scenic routes throughout the city to afford scenic views of the community as well as to link points of visitor interest. Some of the other local jurisdictions within the San Diego region have adopted scenic highway general plan elements or programs.

LIGHT AND GLARE

There are two typical types of light intrusion. First, light emanates from the interior of structures and passes out through windows. Second, light produced from exterior sources, such as street, security, and landscape lighting. *Light spillover* is typically defined as the presence of unwanted or misdirected light on properties adjacent to the property being illuminated. Light spillover can be a nuisance to adjacent areas and can diminish views of the clear night sky. Lighting effects often occur when new nighttime sources of lighting are introduced into an area (County of San Diego 2009).

Glare is described as the distraction, discomfort, or impairment of vision caused by extreme contrasts in the field of vision, where light sources such as sunlight, lamps, luminaries, or reflecting surfaces are excessively bright in relation to the general brightness of surroundings. Glare also results from sunlight reflecting off flat building surfaces, with glass typically contributing the highest degree of reflectivity.

The existing light and glare conditions in the San Diego region vary depending on the area. The more urbanized areas tend to produce high levels of nighttime light; daytime glare from reflective materials such as glass building façades and wide stretches of asphalt roads; and shadows on adjacent outdoor land uses from tall buildings and structures. Suburban areas tend to produce high levels of nighttime light and daytime glare but lower levels of shadows on shade-sensitive uses due to lower building heights. Rural areas tend to produce low levels of nighttime light; low to moderate levels of daytime glare, as agricultural structures and paved roads produce some glare; and very low levels of shadows from taller structures due to the distance between structures (County of San Diego 2011).

DARK SKIES

Dark skies are a natural resource in San Diego County and are essential to the study of the celestial bodies. Rural areas of the San Diego region contain dark skies with little light pollution from urban areas, making it an ideal location for astronomical research. Two world-class observatories, Palomar Observatory and Mount Laguna Observatory, are located in the San Diego region and are considered two of the best such facilities in the United States. The type of research conducted at these facilities has contributed to a greater understanding of our solar system; supported advances in space travel; improved telecommunication systems, defense and surveillance systems, and advanced weather forecasting and atmospheric physics; and provided insight to energy production. In addition, dark skies are an important aspect of the character of rural areas in the San Diego region (County of San Diego 2011).

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

Climate change may threaten aesthetics and visual resources due to sea-level rise altering coastline views, and may have impacts on vegetation, such as negative effects of higher temperatures and higher incidence of

wildfire. The San Diego region is likely to experience sea level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, more intense heat waves, and annual average temperatures increases of up to 4.8°F by 2050, more intense precipitation events that could lead to flooding, and a longer and less predictable fire season. More details on future climate projections are available in Appendix C.

There are limited studies on the effects of climate change on aesthetics, so it is difficult to draw firm conclusions about how climate change will affect aesthetics and visual resources in the San Diego region. Sea-level rise could affect coastline appearance through enhanced coastal erosion and coastal flooding. However, it is not possible to draw specific conclusions on this effect or determine whether this aesthetic impact would be positive or negative. In addition, many local communities in California, including several in the San Diego region, are exploring options for protecting coastlines in response to sea-level rise. In general, adaptation options range from beach nourishment, to establishing natural barriers, to building seawalls or other barriers, to managed retreat from the coastline. Each of these options involves significant investment, negotiation, or consideration of impacts on residents and the natural environment. Seawalls and other engineered adaptation measures could alter coastline views.

Climate change could damage scenic natural resources such as trees and vegetation, including those within state scenic highways. The SANDAG region's natural scenic resources attract tourism and contribute to the health and well-being of residents and visitors.

4.1.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

National Scenic Byway Program

The NSB Program was established by the Federal Highway Administration within the adoption of the Intermodal Surface Transportation Efficiency Act of 1991 (23 USC 162). The NSB Program is a grassroots collaborative intended to recognize, preserve, and enhance selected roads throughout the United States. This voluntary program establishes All-American Roads based on their archaeological, cultural, historic, natural, recreational, and scenic qualities. There are 150 designated roads, including the Sunrise Highway, located in 46 states.

U.S. Department of Transportation Act, Section 4(f)

The U.S. Department of Transportation Act, Section 4(f) established the requirement for consideration of impacts on park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development. Section 4(f) properties include publicly owned public parks, recreation areas, and wildlife or waterfowl refuges, or any publicly or privately owned historic sites listed or eligible for listing in the National Register of Historic Places. The Section 4(f) evaluation is required to discuss a project's impact on the Section 4(f) property, including visual intrusions. (49 USC 303) Under Section 4(f), the Federal Highway Administration and other Department of Transportation agencies cannot approve the "use" of land from Section 4(f) properties unless there is no feasible and prudent avoidance alternative to the use of land, and the action includes all possible planning to minimize harm to the property resulting from such use; or unless the agency determines that the use of the property will have a de minimis impact.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

California Energy Code

The California Energy Code (California Code of Regulations, Title 24, Part 6) creates standards to reduce energy consumption. The type of luminaries and the allowable wattage of certain outdoor lighting applications are regulated which can have an effect on the amount of light and glare related to lighting in new development.

Scenic Highway Program

Recognizing the growing need to protect the state's scenic beauty, the California State legislature established the Scenic Highway Program in 1963. This program was added to the California Streets and Highways Code (Sections 260 et seq.) with the intent to protect and enhance California's beauty, amenity, and quality of life. The program is administered by Caltrans and consists of laws, incentives, and guidelines that are intended to protect the scenic, historic, and recreational resources within designated scenic highway corridors. A scenic highway corridor is defined by Caltrans as the area of land generally adjacent to and visible from the highway (Caltrans 2008). It is usually limited by topography and/or jurisdictional boundaries.

A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. When a city or county nominates an eligible scenic highway for official designation, it must identify and define the scenic corridor of the highway. Because a scenic corridor is the land generally adjacent to and visible from the highway, it is identified using a motorist's line of vision. A reasonable boundary is selected when the view extends to the distant horizon.

The corridor protection program does not preclude development but seeks to encourage quality development that does not degrade the scenic value of the corridor. Jurisdictional boundaries of the nominating agency are also considered. The agency must also adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. These ordinances constitute the scenic corridor protection program.

State goals for scenic highways include the following (Caltrans 2008):

1. Preserve and enhance the unique visual, biological, and ecological resources of the Scenic Highway Corridor.
2. Prevent and eliminate (when reasonably possible) conditions that detract from or compromise the quality of the aesthetic resources of the Scenic Highway Corridor.
3. Encourage the development and maintenance of park and recreational facilities that contribute to the aesthetic quality of the Scenic Highway Corridor.
4. Encourage preservation of historical landmarks adjacent to the Scenic Highway Corridor.
5. Encourage community civic groups to create programs that increase community interest in the visual assets of the Scenic Highway Corridor and facilitate the implementation of such programs.

California Coastal Act

Under the California Coastal Act of 1976 (Public Resources Code Sections 30000 et seq.), scenic and visual qualities of coastal areas are considered and protected as a visual resource. One of the primary objectives of

the Coastal Act is the protection of scenic and visual resources, particularly as viewed from public places. Section 30251 requires that development be sited and designed to protect views to and along the ocean and other scenic coastal areas. New development must minimize the alteration of natural landforms. This policy also requires that development is sited and designed to be visually compatible with the character of surrounding areas. Where feasible, development must include measures to restore and enhance visual quality in visually degraded areas.

LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

County Scenic Highway System

The San Diego County General Plan Conservation and Open Space Element identifies scenic roadways in the unincorporated areas worthy of additional protection status but not covered by the State Scenic Highway Program. A highway may be designated as "scenic" depending upon how much of the natural landscape can be seen by travelers, the aesthetic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. (County of San Diego 2011)

Dark Sky Ordinance

Sections 59.101 through 59.115 of the San Diego County Code, known as the Light Pollution Code or Dark Sky Ordinance, were adopted "to minimize light pollution for the enjoyment and use of property and the night environment by the citizens of San Diego County and to protect the Palomar and Mount Laguna observatories from the impacts related to light pollution that have a detrimental effect on astronomical research by restricting the permitted use of outdoor light fixtures on private property" (Section 59.101). The Ordinance also includes the minimization of light pollution to reduce impacts on wildlife. The Ordinance regulates types of outdoor light fixtures and hours of outdoor lighting. Under the Ordinance, all areas within 15 miles of either observatory are designated as Zone A, and all other areas within the San Diego region are designated as Zone B. Areas within Zone A are subject to more stringent outdoor lighting restrictions. These restrictions would apply to any new outdoor lighting fixtures, including those associated with both land development and transportation improvements.

Local Design Review Programs

Local jurisdictions typically have design review programs in place, which include guidelines to maintain and enhance the character and identity of local communities. Approved design guidelines address issues such as architectural character, view corridor protection, landscaping, parking design, signage, and lighting and glare.

Local Visual Plans and Regulations

Table 4.1-3 details the visual plans and regulations in the San Diego region. Many local jurisdictions in the San Diego region have included policies in their general plans to protect and enhance designated scenic highway corridors. For example, the County's Scenic Highway Program is included within the Conservation and Open Space Element of the County's General Plan. The goals of the County's program are implemented via zoning, building, and grading ordinances. The Scenic Preservation Overlay Zone regulates area, height, and design of signs; requires site plan approval by the Director of Planning; and regulates grading within the overlay zone. The Scenic Area Regulations contained in the County Zoning Ordinance (Part 5, Section 5200) are intended to ensure exclusion of incompatible uses and structures, and to preserve and enhance the scenic resources present in adjacent areas. Another example is the City of Coronado, which also has a Scenic Highway Element

in its General Plan and provides implementing measures via the Sign Ordinance and the Scenic Highway Overlay Zone, and has established the Scenic Highway 75 Beautification and Restoration Project.

Table 4.1-3
Visual Resource Protection Plans and Regulations Governing Scenic Quality in the San Diego Region by Local Jurisdiction

Jurisdiction	Visual Plan or Regulation	Local Scenic Resources
Carlsbad	Scenic Preservation Overlay Zone from the Municipal Code designates areas to preserve or enhance outstanding views, flora, and geology, or other unique natural attributes, and historical and cultural resources of Carlsbad. Currently, the overlay zone is applied to the El Camino Real corridor (City of Carlsbad Municipal Code [MC], Chapter 21.40).	The following resources were identified in the Carlsbad Draft Local Coastal Program (City of Carlsbad 2019): • Coastal corridor/El Camino Real • Buena Vista Lagoon • Agua Hedionda • Batiquitos Lagoon • Agricultural fields (Flower Field/ Strawberry Field)
Chula Vista	Scenic Resources and Open Space Network in the General Plan designates Scenic Roadways and open space, including resources that make up most of the Chula Vista Greenbelt (City of Chula Vista MC, Chapter 17).	The following resources were identified in the Chula Vista General Plan (City of Chula Vista 2005): • Otay River • Sweetwater River • Upper + Lower Otay Lakes • Sweetwater Reservoir • San Miguel Mountains • San Diego Bay • Rice Canyon • Long Canyon
Coronado	Scenic Highway Overlay Zone from the Municipal Code is designed to eliminate unsightly conditions, to protect views from scenic highways, and to retain unusual and attractive natural and human-made features within the scenic corridor (City of Coronado MC, Chapter 86.44).	The following resources were identified in the City of Coronado Local Coastal Program Plan (City of Coronado 2005) and Scenic Resources Element (City of Coronado 1999): • Coronado Bay Bridge • Silver Strand • San Diego Bay • Pacific Ocean • Coastal beaches
Del Mar	Trees, Scenic Views, and Sunlight protection measures recognize that trees, scenic views, and plentiful sunlight contribute to the special character of Del Mar and to the overall quality of life enjoyed by residents, property owners, and visitors. Provides a process by which persons may seek to restore said resources (City of Del Mar MC, Chapter 2330.512). Bluff, Slope, and Canyon Overlay Zone is designed to protect the health, safety, and	The following resources were identified in the City of Del Mar Community Plan (1999); and Local Coastal Program (1993) and Implementing Ordinances (2001): • Coastal beaches • Pacific Ocean • San Dieguito River/Floodplain • Crest Canyon • Peñasquitos Creek

Jurisdiction	Visual Plan or Regulation	Local Scenic Resources
	general welfare, and to control the development of properties within the designated zone to preserve the scenic sandstone bluffs and related canyons and steep slopes which characterize the area within the zone. The unique landforms within the zone provide visual relief and diversity within the City, and they define and separate neighborhoods, enhance the overall quality of Del Mar's local coastal environment, and preserve the economic integrity of Del Mar's visitor-oriented community (City of Del Mar MC, Chapter 30.52).	• Sandstone Bluffs • Beach Bluffs • Canyons and Steep Slopes
El Cajon	Hillside Overlay Zone from the Municipal Code is designed to minimize the disturbance of the natural terrain and thereby conserve the aesthetic qualities afforded by those areas (City of El Cajon Zoning Ordinance, Chapter 17.170).	The following resources were identified in the City of El Cajon General Plan (2001): • Valley floors • Hillsides
Encinitas	Scenic/Visual Corridor Overlay designation identifies those areas of Encinitas where significant aesthetic and visual resources need to be considered before new development proceeds to ensure that significant viewsheds are retained (City of Encinitas MC, Section 30.34).	The following resources were identified in the City of Encinitas General Plan, Resource Management Element (2001): • San Elijo Lagoon • Pacific Ocean • Cardiff Beach/Coastal beaches • Coast Highway 101 • Manchester Avenue
Escondido	Viewshed Protection is designed to preserve and protect existing internal and external view corridors in Escondido, with particular emphasis on ridgelines, unique landforms, and visual gateways and edges of the community (City of Escondido MC, Section 33-1067).	• The following resources were identified in the City of Escondido General Plan (2012): • Lake Wohlford • San Dieguito River • Elfin Forest Recreation Park • Bear Ridge
Imperial Beach	Open Space Zone in the Municipal Code provides for land set aside for the protection of sensitive and fragile natural resources and is intended to limit and control access and intensity of uses in these areas, specifically relating to the Tijuana River Valley (City of Imperial Beach MC, Chapter 19.29).	The following resources were identified in the City of Imperial Beach General Plan (2019): • Tijuana River Estuary • Pacific Ocean • Ream Field • Salt Evaporation Ponds • San Diego Bay • Coastal/Beach area
La Mesa	Scenic Preservation Overlay Zone in the Municipal Code establishes regulations for the recognized scenic areas within the city, the character of which could be permanently damaged by actions involving the	The following resources were identified in the City of La Mesa General Plan Land Use and Urban Design Element (2012): • SR 125/SR 94/I-8 corridor

Jurisdiction	Visual Plan or Regulation	Local Scenic Resources
	development and use of land without special regulations to prevent or mitigate such damage (City of La Mesa MC Chapter 29).	• Hillsides • Rural neighborhoods
Lemon Grove	The Open Space Zone in the Municipal Code establishes regulations for usable open space necessary to fulfill needs for outdoor leisure and recreation, to preserve valuable natural resources, and to improve the amenity of residential living (City of Lemon Grove MC, Chapter 17.24).	• The following resource was identified in the Chollas Creek Feasibility Study (Groundwork San Diego 2015): • Chollas Creek
National City	Viewshed protection in the General Plan is designed to preserve scenic resources and significant viewsheds of San Diego Bay, open space, creeks, and other distinctive scenic resources (City of National City General Plan 2012).	The following resources were identified in the City of National City General Plan, Land Use Element (2011): • San Diego Bay • Hillsides
Oceanside	Scenic Park Overlay District of the Zoning Ordinance is implemented to conserve and protect valuable natural resources of recreational and scenic areas in and adjacent to the Guajome Regional Park and other public parks (City of Oceanside Zoning Ordinance, Article 15).	The following resources were identified in the City of Oceanside General Plan, Land Use Element (2002): • Pacific Ocean • Coastal /Beach area • Guajome Regional Park • San Luis Rey River • Buena Vista Lagoon
Poway	Open Space-Resource Management Zone in the Municipal Code preserves open space for the conservation of natural and cultural resources and maintains the natural character of the land (City of Poway MC, Chapter 17.24).	The following resources were identified in the City of Poway General Plan, Natural Resources Element (1991): • Twin Peaks • Kent Hill • Vandan Park • Tooth Rock • Goat Peak • Iron Mountain
San Diego	Coastal Overlay Zone from the Municipal Code protects and enhances the quality of public access and coastal resources (City of San Diego MC, Chapter 13). Height limits are restricted to 30 feet by the Coastal Zone. Additionally, the City's Environmentally Sensitive Regulations (ESL) of the Development Code were developed to protect, preserve and, where damaged, restore, the environmentally sensitive lands of San Diego and the viability of the species supported by those lands. These regulations are intended to assure that development, including, but not limited to coastal development in the Coastal Overlay Zone, occurs in a manner that protects the overall quality of the resources and the natural	The following resources were identified in the City of San Diego General Plan (2008): • Pacific Ocean, beaches • San Diego Bay • Mission Bay Park • Los Peñasquitos Lagoon • Border Field State Park • Torrey Pines State Reserve • Cabrillo National Monument • Sunset Cliffs • La Jolla Cove • Soledad Mountain • San Diego River • Lake Hodges

Jurisdiction	Visual Plan or Regulation	Local Scenic Resources
	and topographic character of the area, encourages a sensitive form of *development*, retains biodiversity and interconnected habitats, maximizes physical and visual public access to and along the shoreline (City of San Diego 2018).	• San Vicente Reservoir • Mission Trails Regional Park • Santee Lakes Regional Park • Tecolote Canyon • Los Peñasquitos Canyon Preserve • Old Town State Historic Park • Presidio Park
San Marcos	The City's Zoning Code has a Ridgeline Protection and Management Overlay Zone to protect natural viewsheds and unique natural resources in San Marcos, especially hillsides and ridgelines. It also has restrictions on nighttime lighting in commercial areas to limit the amount of light that spills onto adjacent properties or reflects into the sky (City of San Marcos Zoning Code, Chapter 20.260).	The following resources were identified in the City of San Marcos General Plan, Conservation and Open Space Element (2012): • San Marcos Mountains • Merriam Mountains • Mount Whitney • Cerro de La Posas • Double Peak • Owens Peak • Franks Peak
Santee	Park/Open Space Districts as defined in the Municipal Code promotes a balanced mix of open space uses with development throughout the city in order to provide the enhancement of visual resources, avoidance of hazards, and conservation of resources (City of Santee MC, Chapter 17.16).	The following resources were identified in the City of Santee General Plan, Conservation Element (2003): • Mission Trails • Santee Lakes • San Diego River Park • Goodan Ranch • Sycamore Creek • Forester Creek • Rattlesnake Creek
Solana Beach	View Assessment Ordinance in the Municipal Code preserves the existing character of established residential neighborhoods, and the desire to protect public and private views, and aesthetics (City of Solana Beach MC, Section 17.63). Scenic Area Overlay Zone regulates development in areas of high scenic value to preserve and enhance the scenic resources present within and adjacent to such areas (City of Solana Beach MC, Section 17.48). Exterior Lighting Regulations (Dark Sky Overlay) controls excessive or unnecessary outdoor light emissions which produce unwanted illumination of adjacent premises within the city and prescribes standards for the maintenance of designated "dark sky" neighborhoods (City of Solana Beach MC, Section 17.60.060). Chapter 5, Section C, of the City's LCP/LUP establishes policies related to the protection of scenic and visual resources.	The following resources were identified in the City of Solana Beach General Plan, Conservation and Open Space Element (2013): • San Elijo Lagoon • Highway 101/Pacific Coast Highway • Lomas Santa Fe • Coastal/Beach area

Jurisdiction	Visual Plan or Regulation	Local Scenic Resources
Vista	No visual resource protection plans or specific regulations have been established at this time.	N/A
County of San Diego	San Diego County's Resource Protection Ordinance protects sensitive lands and prevents their degradation and loss by requiring the Resource Protection Study for certain discretionary projects.	The following resources were identified in the County of San Diego General Plan Conservation and Open Space Element (2011): • El Capital Reservoir and El Cajon Mountain • Viejas Mountain • Sweetwater River Canyon • Loveland Reservoir • Horsethief Creek/Pine Valley Creek Region • Gaskill Peak Region • Bells Mountain • Gopher Canyon • San Marcos Mountains • Boulder Creek Basin • Descanso Valley • Guatay Mountain • Lake Cuyamaca and Meadows • Crouch Valley • Buckman Springs Meadow • Pine Valley • McGinty/Dehesa/Sequan • Harbison Canyon • North Fork of the Sweetwater River • Lancaster Mountain • Lawson Peak • Mother Grundy • Tecate Peak/Cottonwood Creek • San Miguel/Jamul Mountains • El Cajon Mountain/El Capitan • Reservoir • Jesmond Dene Oaks • Valley Center Ridge • Burnt Mountain • San Marcos Mountains • Mesa Grande • Palomar Mountain/Aqua Tibia Wilderness • Volcan Mountain • Otay Mountain/Lower Otay Lake • San Luis Rey River • Mount Olympus

Jurisdiction	Visual Plan or Regulation	Local Scenic Resources
		• Rainbow Oak Woodland Areas • Goose Valley Ridge • SR 78 Corridor • Mussey Grade Road • Mount Woodson • Batiquitos Lagoon Region • Oak Crest Park Site • San Elijo Lagoon/San Dieguito Park Area • Sweetwater Community Planning Area • Eucalyptus Groves 1, 2, and 3. • Mother Miguel Mountain. • Valley Center Ridge. • Chaparral Ridge. Keys Creek

4.1.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the checklist questions that address the criteria in CEQA Guidelines Appendix G. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, and the unique characteristics of the proposed Plan.

Checklist questions for aesthetic and visual resources impacts are provided in Section I of the State CEQA Guidelines Appendix G. Appendix G criterion I (a) is addressed in AES-1 and criterion I (b) is addressed in AES-2. For purposes of this EIR, the CEQA Guidelines Appendix G, criterion I (c) and criterion (d) have been combined as AES-3.

For the purposes of this EIR, implementation of the proposed Plan would have a significant aesthetic and visual resources impact if it would:

AES-1 Have a substantial adverse effect on a scenic vista.

AES-2 Substantially damage scenic resources, including but not limited to, trees, rocks, outcroppings, and historic structures within a state scenic highway.

AES-3 Substantially degrade the existing visual character or quality of public views of the site and its surroundings, including adding a visual element of urban character to an existing rural or open space area, conflicting with regulations governing scenic quality.

AES-4 Substantially degrade the existing visual character or quality of public views of the site and its surroundings by creating a new source of substantial light or glare that would adversely affect day or nighttime views.

4.1.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

AES-1 HAVE A SUBSTANTIAL ADVERSE EFFECT ON A SCENIC VISTA

ANALYSIS METHODOLOGY

The following analysis evaluates impacts of forecasted regional growth and land use change or planned transportation network improvements that would have a substantial adverse effect on a scenic vista by blocking panoramic views or impeding or detracting from public views of major landscape features or landforms, such as the coast, bays, lagoons, canyons, mesas, and natural vegetation; historic or unique structures; water resources such as reservoirs, lakes, and streams; and large open spaces including preserves and regional parks. The analysis considers the location of new growth and land use change in the region, and the role of local visual protection programs in reducing impacts from the new growth and land use change. A significant impact on scenic vistas would occur when forecasted regional growth and land use change associated with the proposed Plan is proposed in new locations or an increase in the intensity of existing development is planned that would block or otherwise substantially disrupt or detract from panoramic views or views of major landscape features or landforms as seen from public viewing areas.

The analysis of transportation network improvements focuses on the proposed Plan's new infrastructure or facilities that would result in both short-term and/or long-term impacts by impeding, blocking, or detracting from views from scenic vistas throughout the region. Those improvements and programs involving only operational changes would not substantially affect scenic vistas. The analysis generally considers the location of planned transportation network improvements, their proximity to scenic vistas, and the likelihood of the improvement—given scale and typical design characteristics—to impact views.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

By 2025, the region is forecasted to increase by 161,338 people, 97,661 housing units, and 115,328 jobs. As shown in Figure 2-17 of Chapter 2, *Project Description,* regional land use and development changes would be evident by 2025 when compared to existing baseline conditions. The increased density can be seen when comparing the existing housing density to the 2025 housing density, as shown in Figures 2-9 and 2-10, respectively, of Section 4.14, *Population and Housing.* Approximately 79 percent of the 2025 population growth would occur within the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent). These three jurisdictions accommodate over 78 percent of new housing units, while the City of San Diego, City of National City, City of Chula Vista accommodate approximately 78 percent of new jobs in the region by 2025. New development caused by regional growth and land use change would include new housing units, services, commercial areas, industrial centers, schools, and civic uses. Concentrated growth is also expected to occur around the planned Mobility Hubs throughout the region. Some growth would be in the form of new developments or communities, such as in the City of San Diego communities of Mission Valley West and East (San Diego State University [SDSU] West and Aztec Stadium) and in eastern Chula Vista and East Otay Mesa. However, a substantial portion of new growth would occur within existing established communities such as the City of San Diego communities of the, Downtown, Midway-Pacific Highway, and University Center, the cities of Chula Vista and Escondido, and in rural communities in the unincorporated County such as North County

Metro and Otay(refer to Tables 2-2 through 2-4 in Chapter 2, which present base year and forecasted population, employment, and housing units by each jurisdiction).

Scenic vistas in the North County area that would be affected by new development include the long-range views of the coastal mountain ranges and habitat preserves; unobstructed views of the Pacific Ocean from the Pendleton-De Luz area; and views of highly scenic lagoons and waterways such as Batiquitos, Agua Hedionda, Buena Vista, San Elijo, and Los Peñasquitos Lagoons, and the San Dieguito and San Luis Rey Rivers along the I-5 corridor. Scenic vistas that would be affected in the South Bay area include the Otay River, Sweetwater River Valley, upper and lower Otay Lakes, the Sweetwater Reservoir, and San Diego Bay. In the East County, scenic resources that would be affected include large open space parks, preserves, mountain ranges, and reservoirs.

Density of new development would increase by 2025, and some currently developed areas would be infilled, such as City of San Diego communities; inland areas such as Vista, San Marcos, and Escondido; and communities in La Mesa, Santee, Lemon Grove, Spring Valley, and El Cajon. New development would be located on hillsides and along the ocean, bays, or rivers, which in some locations would impede or block panoramic views or views of major landscape features or landforms as seen from public viewing areas (coastlines, bays, lagoons, canyons, mesas, natural vegetation, and historic or unique structures; water resources such as reservoirs, lakes, and streams; and large open spaces including preserves and regional parks).

The introduction of new development in some areas would also result in short-term construction impacts related to scenic vistas, creating temporary views of earth-moving activities, denuded slopes, large construction equipment and vehicles, and staging areas. Regarding more permanent impacts, future development must comply with adopted policies that regulate the design of new buildings and protect the existing visual quality of the local jurisdiction. For example, as listed in Table 4.1-3, local jurisdictions have adopted visual regulations that require all development to adhere to standards that address bulk, mass, articulation, height, and transition issues (such as the interface with surrounding or adjacent development and uses), and minimize negative impacts on the community. Visual policies also ensure exclusion of incompatible uses and structures, and preserve and enhance the scenic resources present in adjacent areas. In addition, all development or redevelopment projects would undergo further environmental and design review on a project-by-project basis to ensure that substantial adverse effects on scenic vistas are identified and avoided or reduced to the extent feasible. Development in the Coastal Zone would need to adhere to the California Coastal Act and local coastal plans, while typical measures in local plans require development to be sited and designed to protect views to and along the ocean and other scenic coastal areas.

These measures would reduce adverse effects on scenic vistas. However, even with implementation of such measures, it cannot be guaranteed that substantial adverse effects on scenic vistas would be avoided or reduced for all projects. Some new development would obstruct, interrupt, or detract from a scenic vista. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

Planned transportation network improvements by 2025 include the 5 Big Moves as described in Chapter 2, *Project Description*. These improvements include the development of Complete Corridors, Transit Leap, Mobility Hubs, Flexible Fleets and Next Operating Systems. Complete corridor improvements incorporate roadway, highway, active transportation, transit, and technology enhancements throughout the San Diego region. The major corridors include the following: South Bay to Sorrento, Central Mobility Hub, SR 125, I-15, I-5 North Coast Corridor, SR 94, I-8, Coast, Canyons, and Trails, SR 56, and San Vicente. Major corridor improvements include portions of the LOSSAN rail corridor double-tracking, continued improvement of

Managed Lanes on I-5, new toll lanes on SR 11 to the Otay Mesa Port of Entry (POE), and interchange and arterial operational improvements at SR 94 and SR 125.

Some of the improvements in the proposed Plan by 2025 would involve only operational changes that would not require construction of new transportation or transit facilities, such as increasing service frequencies or new transit routes within existing right-of-way. These changes would generally not lead to impacts on scenic vistas. However, improvements that would involve construction of new infrastructure or facilities that could impact scenic vistas include highway improvements (such as lane expansions) and construction of new Managed Lanes as part of the Complete Corridors program, new infrastructure as part of the Mobility Hubs, and commuter rail upgrades as part of the Transit Leap Program which would require grading and other ground-disturbing activities.

As part of the Complete Corridors Program, improvements along the I-5 corridor from Manchester Avenue to Vandegrift, include the addition of new Managed Lanes that would obstruct views to scenic resources. New Managed Lanes on existing highway facilities, with the exception of the I-5 Managed Lanes described above, would involve relatively minor impacts on scenic vistas because of their location in developed urban environments. However, visual impacts due to the obstruction, interruption, or detraction from a scenic vista would occur when proposed alignments or facilities require large cut-and fill slopes or sound attenuation barriers that impede or block public views. Careful alignment and design, collaboration with local jurisdictions, and conformance with local grading ordinances would reduce scenic vista impacts. However, some transportation network improvements are located in areas where scenic vista impacts cannot be avoided.

Mobility Hubs are communities with a high concentration of people, destinations, and travel choices. Most Mobility Hub improvements would occur within urban areas, and would not obstruct, interrupt, or detract from a scenic vista. However, development of some Mobility Hubs may result in major improvements that would change the visual character of the surrounding area. New construction could impede or block public views of scenic vistas. Significant changes to the visual character of the Central Mobility Hub and San Ysidro Mobility Hub surrounding areas would occur.

Transit Leap improvements consist of improvements to existing transit services- such as the Trolley, COASTER, SPRINTER, and Rapid. These improvements may include additional rail tracks and more frequent service. Based on the LOSSAN Program EIR/EIS (U.S. Dept. of Transportation 2007), the coastal rail double-tracking along the I-5 corridor would occur in highly scenic areas along the corridor, and the visual impact would be dependent on the sensitivity of the landscape and compatibility with existing visual features. Although the LOSSAN corridor extends through a highly scenic area, traversing several coastal lagoons, the addition of a new tracks to the single track would not obstruct, interrupt, or detract from a scenic vista. Short-term visual impacts would occur during construction.

The planned transportation improvements in 2025 also include various improvements to regional arterials, including new travel lanes, bike lanes, sidewalks, trails, and new and replacement bridges. Such projects are located in the cities of Carlsbad, Chula Vista, and Escondido, and in unincorporated San Diego County. Most of these improvements would be minor and occur on existing facilities. However, construction activities in some locations would obstruct, interrupt, or detract from a scenic vista due to the presence of construction equipment, scaffolding, and earthmoving, and temporary removal of existing vegetation.

The proposed Plan includes active transportation investments, such as safe routes to transit at all new Mobility Hubs and major corridors, and development of various types of bikeways throughout the region. Additionally,

the proposed Plan anticipates transit service improvements in 2025, including the development of rapid transit service throughout the more densely populated areas of the San Diego region. Increases in transit service and the development of an active transportation network would not obstruct, interrupt, or detract from a scenic vista.

Short-term effects on scenic vistas would occur during construction of transportation network improvements, blocking panoramic views or impeding public views of major landscape features or landform with construction equipment, scaffolding, temporary signage, and construction staging areas. Long-term scenic vista impacts would also occur following construction in some locations; for example, transportation network improvement projects in or within view of floodplains, wetlands, wooded areas, coastal bluffs, lagoons, reservoirs, regional parks, recreational areas, agricultural lands, or in areas that include steep slopes would have substantial adverse effects on scenic vistas by blocking or impeding public views of scenic vistas. Transportation network improvements would thus have a significant impact.

2025 Conclusion

Development associated with regional growth and land use change, as well as transportation network improvements, would have substantial adverse effects on scenic vistas. Therefore, this impact (AES-1) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional population is forecasted to increase by 149,500 people; housing by 121,650 units; and employment by 159,728 jobs. As shown in Figure 2-18 of Chapter 2, regional land use and development changes would be evident by 2035 when compared to existing baseline conditions. The increased density can be seen when comparing the existing housing density to the 2035 housing density, as shown in Figures 2-10 and 2-11, respectively, of Section 4.14. In terms of growth in total jobs over the forecasted time period, the majority of job growth is expected to occur in the City of San Diego (71 percent), City of National City (7 percent), and City of Chula Vista (2 percent) and. The community planning areas in the City of San Diego that show the highest growth in jobs are Downtown, Mission Valley, Kearny Mesa, and Midway Pacific Highway. The highest proportions of forecasted job increases are in the communities of Downtown, Kearny Mesa, University City, and Otay Mesa (refer to Tables 2-2 through 2-4 in Chapter 2, which presents base year and forecasted population, employment, and housing units by each jurisdiction).

Areas of increased residential density by 2035 are projected within existing established communities such as the City of San Diego communities of Downtown, Kearny Mesa, Midway-Pacific Highway, Otay Mesa, University Center, and Mission Valley. Established communities in Chula Vista and San Marcos, are also expected to see increased density. By 2035, some regional growth would be accommodated in the northern and eastern, rural areas of the region, including Lakeside, North County Metro and Otay. Development in these areas would take place mostly along highway corridors, such as I-5, SR 76, SR 78, I-15, I-805 east of Chula Vista, and SR 11, and generally within San Diego County community planning areas.

Scenic vistas as discussed in the 2025 analysis may be affected by regional growth and land use change projected to occur in 2035. Impacts on scenic vistas include blocking or impeding panoramic views and views of major landscape features during development and redevelopment activities. Construction of new development in some areas would also result in short-term construction impacts related to scenic vistas,

creating temporary views of earth-moving activities, denuded slopes, large construction equipment and vehicles, and staging areas.

As discussed in the 2025 analysis, various jurisdictions have adopted visual regulations that require all development to adhere to standards that address bulk, mass, articulation, height, and transition issues (such as the interface with surrounding or adjacent development and uses), and reduce negative impacts on the community. Adherence to these measures, including the Coastal Act, would reduce adverse effects on scenic vistas. However, even with implementation of such measures, it cannot be guaranteed that substantial adverse effects on scenic vistas would be avoided or reduced for all projects. Some new development would obstruct, interrupt, or detract from a scenic vista. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

By 2035, additional transportation network improvements would occur in the San Diego region as part of the proposed Plan. Some of the improvements in the proposed Plan completed by 2035 would involve only operational changes that would not require construction of new transportation or transit facilities, such as increasing service frequencies or creating new transit routes, and therefore, would have little impact on scenic vistas. However, implementation of the Big 5 Moves as described in Section 2, Project Description, include Complete Corridor improvements consisting of continued double-tracking at certain locations on the LOSSAN rail corridor, increased in COASTER frequencies, and grade separation at Leucadia Blvd. The 2035 phase also includes a major new commuter rail line (Route 582) from Sorrento Mesa to National City via UTC, Kearny Mesa. and University Heights; and commuter rail service from Oceanside to Downtown, including a tunnel in Del Mar, and stations at Central Mobility Hub and Camp Pendleton (CR 398). Double and third-tracking and rail grade separations include the Blue Line, Green Line and Orange line through the South Bay and East County communities. The construction of commuter rail service into new areas, between Oceanside and Downtown and Sorrento Mesa to National City via UTC, Kearny Mesa, and University Heights would impair or detract from scenic vistas with the introduction of a new infrastructure, including tracks, station platforms, overhead catenary wire, and other features such as above-grade guideways and overcrossings. The addition of a second or third track to existing tracks along the COASTER and SPRINTER corridors and a second or third track to existing tracks along the South Bay and East County corridors would not substantially obstruct, interrupt, or detract from a scenic vista.

In 2035, the Complete Corridor Program includes new Managed Lanes and Managed Lane Connectors on the SR 15, SR 94, SR 78, SR 163, SR 125, I-5, I-8, and I-805 corridors that would involve relatively minor impacts on scenic vistas because of their location in urban environments. Improvements along SR 52 include highway widening that may potentially affect a designated scenic vista. Adverse scenic vista impacts would occur for alignments and facilities that require large cut-and-fill slopes or noise barriers, whether in previously undeveloped areas or developed urban areas. Careful alignment and design, collaboration with local jurisdictions, and conformance with local grading ordinances to ensure compatibility with surrounding development would reduce impacts. Improvements to the I-5 corridor that involve installing soundwalls would obstruct views to scenic resources from private residences located at an elevation higher than the freeway. Two new Managed Lanes on SR 78 would not obstruct, interrupt, or detract from a scenic vista, such as views of the Batiquitos Lagoon, Pacific Ocean, and steep rugged terrain near the Twin Oaks to I-15 corridor. However, the locations of some transportation network improvements and certain design features (e.g., above-grade facilities, retaining walls, sound attenuation walls, cut-and-fill activities) cannot avoid physical changes that have substantial adverse effects on scenic vistas, including blocking panoramic views or views of major landscape features or landforms. Transportation network improvements would cause a significant impact. The

proposed Plan contains four transportation network improvements on the arterial roadway system in 2035. These projects include addition of new lanes, and Class II bicycle lanes along Carlsbad Boulevard in the City of Carlsbad, new travel lanes and bicycle lanes and pedestrian pathways in the community of Ramona, bridge widening, new ramps and realignment of existing ramps at Palm Avenue/SR 805 in the South Bay, and new interchange and roadway improvements at SR 78. Scenic views along these corridors are of the coast along Carlsbad Boulevard and rolling hills and valleys in Ramona and SR 78. Road widening and bikeway improvements would result in change in the visual environment that would obstruct, interrupt, or detract from a scenic vista, during both construction and operation and result in a substantial adverse effect.

Active transportation improvements by 2035 include development of various bikeways throughout the region, including bikeway improvements to the Coastal Rail Trail and the Bayshore Bikeway. Transit service improvements to be constructed by 2035 include increases in service for the COASTER and SPRINTER, extensions and increases in service of the Trolley, new commuter rail service, Mobility Hub centers, and several new rapid transit routes. Increases in transit services and the development of an active transportation network would not substantially obstruct, interrupt, or detract from a scenic vista.

2035 Conclusion

Development associated with regional growth and land use change, as well as transportation network improvements, would have substantial adverse effects on scenic vistas. Therefore, this impact (AES-1) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, regional population is forecasted to increase by 125,725 people, 61,433 housing units, and 164,843 jobs. The 2050 regional land use pattern is shown in Figure 2-19. Approximately 78 percent of the 2050 population would occur in the City of San Diego (37 percent), City of Chula Vista (28 percent), and City of San Marcos (13 percent). As shown in Figure 2-19 of this EIR, regional land use and development changes are evident by 2050. The increased density can be seen when comparing the existing housing density to the 2050 housing density, as shown in Figures 2-11 and 2-12 respectively. Similar to buildout conditions in 2035, areas of increased residential density by 2050 are expected within existing established communities such as the City of San Diego communities of Downtown, Midway Pacific Highway, and Uptown. The highest proportions of forecasted job increases are in the communities of Downtown, Otay Mesa, Kearny Mesa, and University City.

New development is also projected in the north coastal corridor between Del Mar and Marine Corps Base (MCB) Camp Pendleton, the area between MCB Camp Pendleton and I-15, the corridor along SR 78 between Vista and San Marcos, northeast of I-15 and Escondido, the SR 56 corridor, and along Carmel Valley and Poway. In the South Bay, development is expected adjacent to SR 125 in the Otay Ranch area, SR 11 in East Otay Mesa, and along the SR 94 and I-8 corridors. Regional growth is projected in the unincorporated areas of Lakeside, North County Metro and Valle de Oro. There are no housing units built in the unincorporated area after 2035. The only significant increase in jobs over that period are in Otay.

Scenic vistas as discussed in the 2025 analysis may be affected by regional growth and land use change projected to occur in 2035. Landforms consisting of steep mountain ranges and rural valleys dominate the scenic vistas in the inland regions. As shown in Figure 4.1-1, these areas are located northeast of Escondido to SR 76, east of MCB Camp Pendleton, and north and south of the SR 78 corridor. Large pockets of land currently used for agricultural purposes would be developed with spaced, rural residential uses. New development

would be located on hillsides, and along the ocean, bays, or rivers, which in some locations would impede or block panoramic views or views of major landscape features or landforms as seen from public viewing areas (coastlines; bays; lagoons; canyons; mesas; natural vegetation; historic or unique structures; water resources such as reservoirs, lakes, and streams; and large open spaces including preserves and regional parks). Construction of new development in some areas would also result in short-term impacts related to scenic vistas, creating temporary views of earthmoving activities, denuded slopes, large construction equipment and vehicles, and staging areas.

As discussed in the 2025 analysis, while existing visual regulations, development codes, and laws would reduce impacts on scenic vistas upon implementation of the proposed, it cannot be guaranteed that substantial adverse effects on scenic vistas would be avoided or reduced for all future projects. Some new development would obstruct, interrupt, or detract from a scenic vista. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

By 2050, additional transportation network improvements would occur in the San Diego region as part of the proposed Plan. Implementation of the Big 5 Moves as described in Section 2, Project Description, include Complete Corridor improvements consisting of continued double-tracking at certain locations on the LOSSAN rail corridor, increases in COASTER frequencies, construction of the Sorrento Mesa and UTC tunnels and a new station at Balboa Avenue. The 2050 phase also includes three new major commuter rail lines. These include the completion of commuter rail service from Sorrento Mesa to National City via UTC, Kearny Mesa, and University Heights (CR 582); Oceanside to downtown San Diego via Sorrento Mesa and UTC tunnels and stations at Balboa Avenue (CR 398); commuter rail service from the Central Mobility Hub to the U.S. border via downtown San Diego (CR 583); and commuter rail service from downtown San Diego to El Cajon via SDSU and La Mesa (CR 581). The SPRINTER rail lines would be extended from Escondido to the ~~North County Fair~~Westfield North County Shopping Center.

The extension of new commuter rail lines would largely extend through highly urbanized corridors in North County, South Bay, and East County and would pass through communities that have scenic vistas of the Pacific Ocean, San Diego Bay, Otay River, Sweetwater River, and San Diego River, preserves, canyon lands, and parks. Portions of the new commuter rail lines would impair or detract from scenic vistas in these communities with the introduction of new infrastructure, including tracks, station platforms, overhead catenary wire, and other features such as above-grade guideways and overcrossings.

Major transportation network improvements by 2050 include additional Managed Lanes and ramp improvements along portions of I-5, SR 15 and I-15, I-805, SR 52, SR 54, SR 56, SR 94, SR 163, SR 125, and SR 905; rural highway improvements along I-8, SR 94, SR 76, SR 79 would consist of intersection improvements and shoulder widening. Roadway improvements also include goods movement support with Harbor Drive multimodal corridor improvements and the Otay Mesa POE pedestrian bridge. By 2050, active transportation projects include buildout of the San Luis Rey River Trail and bikeway trails in the Encinitas–San Marcos corridor; Camp Pendleton Trail; I-15 Bikeway; SR 56 Bikeway; SR 52 Bikeway; I-8 Corridor Trail; I-805 corridor; SR 905 corridor; El Camino Real Bike Lanes; Carlsbad to San Marcos corridor; Mira Mesa corridor; Mid-County Bikeway; Central Coast corridor; downtown San Diego to Southeast San Diego corridor; San Diego River Bikeway; Kearney Mesa to Beaches corridor; and several enhanced bike lanes through Santee, El Cajon, La Mesa, and unincorporated San Diego County.

Improvement of existing highway facilities along SR 15, SR 52, SR 94, and SR 54, which largely consist of new Managed Lanes, would result in relatively minor impacts on scenic vistas because of their location in urban environments. Improvements along portions of SR 125 and SR 52, which include ramp improvements and new Managed Lanes, may potentially affect highly scenic vistas. Adverse impacts would occur for alignments and facilities that require large cut-and-fill slopes or noise barriers, whether in undeveloped areas or developed urban areas. Careful alignment and design, collaboration with local jurisdictions, and conformance with local grading ordinances to ensure compatibility with surrounding development would reduce scenic vista impacts. Improvements to the I-5 corridor that involve installing soundwalls would obstruct views to scenic resources from private residences located at an elevation higher than the freeway. Thus, the locations of some transportation network improvements and certain design features (e.g., above-grade facilities, retaining walls, sound attenuation walls, cut-and-fill activities) cannot avoid physical changes that have substantial adverse effects on scenic vistas, including blocking panoramic views or views of major landscape features or landforms. Transportation network improvements and programs would cause a significant impact.

2050 Conclusion

Development associated with regional growth and land use change, as well as transportation network improvements, would have substantial adverse effects on scenic vistas. Therefore, this impact (AES-1) in the year 2050 is significant.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects on scenic vistas. While both the proposed Plan and climate change could result in effects to scenic vistas, the proposed Plan is not expected to interact with climate change in a way that would worsen the climate change effects.

MITIGATION MEASURES

AES-1 HAVE A SUBSTANTIAL ADVERSE EFFECT ON A SCENIC VISTA

2025, 2035, and 2050

AES-1a Protect Public Views of Scenic Vistas for Transportation Network Improvements. During planning, design, project-level CEQA review, and construction of transportation network improvements, SANDAG shall, and other transportation project sponsors can and should, ensure that projects protect public views of scenic vistas. Construction and operational measures include, but are not limited to, the following:

- Site construction staging areas away from scenic vistas. Where infeasible, reduce the visibility of construction staging areas. Fence and screen these areas with low contrast materials consistent with the surrounding environment.
- Avoid permanent obstruction of scenic vistas from public viewing areas when selecting alignments and the grade of new infrastructure (i.e., above, at, or below grade).
- Use transparent safety barrier designs (e.g., railings) rather than walls.

AES-1b Protect Public Views of Scenic Vistas for Development Projects. During planning, design, project-level CEQA review, and construction of development projects, the County of San Diego, cities, and other local jurisdictions can and should incorporate scale and massing measures, including those listed under mitigation

measure AES-1a as well as measures specific to development projects. These measures include, but are not limited to, the following:

- Ensure building siting, height, and mass protect views of scenic vistas.
- Design projects to minimize contrasts in scale and massing between the project and surrounding natural forms and developments. Avoid large cuts and fills when the visual environment (natural or urban) would be substantially disrupted. Site or design of projects should minimize their intrusion into important viewsheds and use contour grading to better match surrounding terrain.
- Screen development adjacent to natural features as appropriate so that development does not appear visually intrusive, or interfere with the experience within the scenic vista. The provision of enhanced landscaping adjacent to natural features could be used to soften the appearance of or buffer development from the natural features.
- Require development within visually sensitive areas to minimize visual impacts and to preserve unique or special visual features, particularly in rural areas, through the following:
    - Creative site planning.
    - Integration of natural features into the project.
    - Appropriate scale, materials, and design to complement the surrounding natural landscape.
    - Minimal disturbance of topography.
    - Clustering of development to preserve a balance of open space vistas, natural features, and community character.
    - Creation of contiguous open space network.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of mitigation measures AES-1a and AES-1b would reduce significant impacts on scenic vistas caused by blocking panoramic views or impeding public views of major landscape features or landforms. However, some of the development associated with regional growth and land use change and transportation network improvements would be located in areas where substantial adverse effects on scenic vistas cannot be avoided. It cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, substantial adverse impacts on scenic vistas would remain significant and unavoidable.

AES-2 SUBSTANTIALLY DAMAGE SCENIC RESOURCES, INCLUDING BUT NOT LIMITED TO, TREES, ROCKS, OUTCROPPINGS, AND HISTORIC STRUCTURES WITHIN A STATE SCENIC HIGHWAY

ANALYSIS METHODOLOGY

This analysis examines how forecasted regional growth and land use or planned transportation network improvements and programs would damage two types of scenic resources: (1) scenic resources within a state scenic highway, and (2) other scenic resources identified in local plans, including local scenic routes. Damage to scenic resources within a scenic highway or other scenic resources, including local scenic routes, would occur if development were to detract or diminish the elements that contribute to the scenic corridor of the

route. For example, in some locations, a modern office building or retail center located along such a highway/route would be incongruous with the surrounding scenic nature if not properly shielded from view.

Areas identified for forecasted regional growth and land use change or planned transportation network improvements under the proposed Plan were considered for their proximity to designated scenic highways and roads in the region. In those areas, the impacts on scenic resources are evaluated given the scale and typical design characteristics of the development or improvements that are included in the proposed Plan. A significant impact on scenic resources would occur if forecasted regional growth and land use change or planned transportation network improvements associated with the proposed Plan would occur in new locations, or an increase in the intensity of existing development is planned that would block or otherwise substantially disrupt views of scenic resources within a state scenic highway.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

The proposed Plan forecasts a general intensification of existing land uses within urban communities and along major transportation corridors. New development caused by regional growth and land use change would include new housing units, services, commercial areas, industrial centers, schools, and civic uses. Concentrated growth is also expected to occur around the planned Mobility Hubs throughout the region, including the Central Mobility Hub and San Ysidro Mobility Hub. While some growth would be in the form of new developments or communities, such as in the City of San Diego communities of Mission Valley West and East (SDSU West and Aztec Stadium) and in eastern Chula Vista and East Otay Mesa, a substantial portion of new growth also would occur within existing established communities such as the City of San Diego communities of the Downtown Area, Midway-Pacific Highway, Kearny Mesa, and University Center; the cities of Chula Vista and Escondido; and in rural communities in the unincorporated County such as North County Metro, and Otay.

The proposed Plan would result in adverse aesthetic and visual resource impacts related to implementation of regional growth and land use change along eligible and designated scenic highways as well as local scenic routes and protected public viewsheds. New development associated with regional growth in the north coastal area between Del Mar and Oceanside would occur adjacent to and visible from vehicles traveling on state-eligible scenic highways such as I-5 and SR 76. Scenic resources along the I-5 coastal corridor include views of local beaches and the ocean; various estuaries and lagoons such as Buena Vista, Agua Hedionda, and Batiquitos Lagoon; the agricultural fields in Carlsbad; San Dieguito River; and Peñasquitos Lagoon.

Along the SR 76 corridor, scenic resources include Guajome Regional Park, San Luis Rey River, and Buena Vista lagoon. Growth in the La Mesa and Lemon Grove communities would be adjacent to SR 94, an eligible scenic highway, and SR 125, a designated state highway. Scenic resources along these corridors include trees, rock outcroppings, canyon lands, and ridgelines. New growth in Santee would occur adjacent to SR 52, of which the area between I-15 east and Santo Road is a designated state scenic highway and the area east of Santo Road to SR 67 is designated as an eligible scenic highway, and includes scenic resources such as San Diego River, Mission Trails, Santee Lake, and Sycamore and Rattlesnake Creeks. Development would also occur adjacent to scenic resources identified in local plans (local scenic routes and protected public viewsheds) such as the forecasted growth in Oceanside, Carlsbad, and Encinitas. Scenic resources include the coastal beaches, ocean, estuaries, and lagoons. The planned regional growth and land use change in 2025 would damage scenic resources including, but not limited to, trees, rocks, and outcroppings, within a state scenic highway and other

local scenic resources and protected public viewsheds identified in local plans. This impact would be significant.

Transportation Network Improvements and Programs

Planned transportation network improvements by 2025 include the 5 Big Moves as described above and include the development of Complete Corridors, Transit Leap, Mobility Hubs, Flexible Fleets and Next Operating Systems. The planned transportation improvements in 2025 also include various improvements to regional arterials, including new travel lanes, bike lanes, sidewalks, trails, and new and replacement bridges. Local scenic resources identified in local plans (local scenic routes, protected public viewsheds) are identified in Table 4.1-3. Potential impacts on scenic resources and public viewsheds could occur with planned transportation improvements in the northern coastal communities. Scenic resources include the coastal corridor with views of local beaches and the ocean; various estuaries and lagoons such as Buena Vista, Agua Hedionda, and Batiquitos Lagoon; the agricultural fields in Carlsbad; San Dieguito River; and Peñasquitos Lagoon. Scenic resources or public viewsheds would be affected by the regional arterial projects in the City of Carlsbad, and include views of local beaches and oceans and estuaries from I-5, a state-eligible scenic highway. Table 4.1-4 lists the scenic highways in the San Diego region that would be affected by implementation of the 2025 transportation network improvements in the proposed Plan.

Table 4.1-4
Transportation Network Improvements Relative to Designated or Eligible Scenic Highways (2025)

Scenic Route	Proposed Improvement	Impact
I-5 (E)	LOSSAN rail double-tracking, additional Managed Lanes, roadway widening, Mobility Hubs including: Carlsbad Palomar, Carlsbad Village, Carmel Valley, Encinitas, La Jolla, Oceanside, Pacific Beach, and Solana Beach.	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
SR 76 (E)	Managed Lanes	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
SR 75 (D)	Arterial improvements, Mobility Hubs including Coronado and Imperial Beach.	New construction may impede or block scenic resources (local beaches and bay views)

(E) = Eligible for designation as a scenic highway; (D) = Officially designated as a scenic highway

While there are no restrictions on modifications to scenic highways, local agencies and Caltrans must work together to coordinate projects and ensure the protection of the scenic value (Section 260 et seq.). For example, State law requires the undergrounding of all visible electricity distribution lines within 1,000 feet of a scenic highway. In some cases, local governments have their own land use and site planning regulations to protect scenic values along a given corridor. The proposed Plan's 2025 transportation network improvements would damage scenic resources including, but not limited to, trees, rocks, and outcroppings, within a state scenic highway and other local scenic resources and protected public viewsheds identified in local plans. This impact would be significant.

2025 Conclusion

Implementation of regional growth and land use change and transportation network improvements would substantially damage scenic resources within a state scenic highway and other local scenic resources and

protected public viewsheds identified in local plans. Therefore, this impact (AES-2) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

Areas of increased residential density by 2035 are projected within existing established communities such as the City of San Diego communities of Downtown, Kearny Mesa, Midway-Pacific Highway, Otay Mesa, and Mission Valley. Established communities in Chula Vista, San Marcos, and Escondido are also expected to see increased density. By 2035, some regional growth would be accommodated in the northern and eastern rural areas of the region, including North County Metro and Otay. Development in these areas would take place mostly along highway corridors, such as I-5, I-15, I-805 east of Chula Vista, SR 11, SR 76, and SR 78, and generally within San Diego County community planning areas.

Local scenic resources and public viewsheds within a state scenic highway, as discussed in the 2025 analysis, may be affected by regional growth and land use change projected to occur in 2035.

Within these growth areas and others, there would be adverse scenic resources impacts related to development of land use projects along eligible and designated scenic highways and scenic resources identified in local plans and protected public viewsheds. Impacts would occur if development detracts or diminishes the elements that contribute to the scenic nature of the highway, including damage to trees, rocks, outcroppings, and historic bridges within a state scenic highway and local scenic routes and protected public viewsheds. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

Planned transportation network improvements by 2035 include the 5 Big Moves as described above and include the development of Complete Corridors, Transit Leap, Mobility Hubs, Flexible Fleets and Next Operating Systems. The proposed Plan includes the construction of new rail and transit facilities by 2035, such as the development of commuter rail service from Sorrento Mesa to National City via UTC, Kearny Mesa, and University Heights (CR 582); and commuter rail service from Oceanside to Downtown, including a tunnel in Del Mar, and stations at the Central Mobility Hub and Camp Pendleton (CR 398). Improvements also include an Automated People Mover at the Central Mobility Hub and an additional anchor mobility hub at the San Ysidro Transit Center (San Ysidro Mobility Hub). The proposed Plan also includes double-tracking and several grade separation projects in 2035 for the LOSSAN, SPRINTER, and Trolley. Double and third-tracking and rail grade separations include the Blue Line, Orange Line, and Green Line through the South Bay and East County communities. New commuter rail service between Oceanside and Downtown would occur adjacent to and be visible from vehicles traveling on state-eligible scenic highways such as I-5.

Active transportation improvements by 2035 include development of various bikeways throughout the region, including bikeway improvements to the Coastal Rail Trail and the Bayshore Bikeway. Transit service improvements to be constructed by 2035 include increases in service for the COASTER, extensions and increases in service of the Trolley, and several new rapid transit routes. Increases in transit services and the development of an active transportation network would be visible from vehicles traveling along SR 76, which is a state-eligible scenic highway. The addition of a second track to an existing single track along the COASTER corridor would not detract or impair views from I-5, a state-eligible scenic highway. The proposed trolley improvements in the South Bay and East County would not occur in proximity to state-designated or eligible scenic highways.

The proposed Plan contains four transportation network improvements on the arterial roadway system in 2035. These projects include addition of new lanes, and Class II bicycle lanes along Carlsbad Boulevard in the City of Carlsbad, new travel lanes and bicycle lanes and pedestrian pathways in the community of Ramona, bridge widening, new ramps and realignment of existing ramps at Palm Avenue/SR 805 in the South Bay, and new interchange and roadway improvements at SR 78. Arterial improvements in northern inland communities would impact scenic resources and public viewsheds along SR 78, a local scenic roadway designated by the City of San Marcos and I-5, an eligible scenic highway. Road widening and bikeway improvements in Ramona and South Bay would not occur in proximity to any state-designated or eligible scenic highway.

Most of the Managed Lane improvements planned by 2035 are located in the more urbanized areas of the San Diego region such as I-5, I-15, segments of I-8 and SR 94, and I-805. Highway improvements would be visible to vehicles traveling along SR 52, SR 125, and in the I-8 and SR 94 rural corridors, which are state-designated and eligible scenic highways. Table 4.1-5 lists the scenic highways in the San Diego region that would be affected by implementation of the 2035 transportation projects in the proposed Plan, identifies the proposed improvements, and includes the impact that would occur.

Table 4.1-5
Transportation Network Improvements Relative to Designated or Eligible Scenic Highways (2035)

Scenic Route	Proposed Improvement	Impact
I-5 (E)	LOSSAN rail double-tracking, additional Managed Lanes, roadway widening, Mobility Hubs including: Carlsbad Palomar, Carlsbad Village, Carmel Valley, Encinitas, La Jolla, Oceanside, Pacific Beach, and Solana Beach.	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
I-8 (E)	Interchange/intersection improvements	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
SR 52 (E) (D)	Roadway widening, Managed Lanes	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
SR 94 (E)	Freeway connections, Managed Lanes, roadway widening	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
SR 76 (E)	Managed Lanes	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
SR 78 (D)	Arterial improvements, Mobility Hubs including Escondido.	New construction may impede or block scenic resources
SR 125 (D)	Managed Lanes	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings

(E) = eligible for designation as a scenic highway; (D) = officially designated as a scenic highway

The potential for transportation network improvements and programs to impact trees, rocks, outcroppings, or other scenic elements such as historic resources also exists. As discussed above, many of the improvements are in areas with designated scenic resources, including historic structures and scenic rock outcroppings. Therefore, there is potential for transportation network improvements to affect these scenic resources. Due to

the location of these transportation network improvements along scenic highways and affecting associated scenic resources, this would be a significant impact.

2035 Conclusion

Implementation of regional growth and land use change and transportation network improvements would result in new development and infrastructure affecting scenic resources, including trees, rocks, outcroppings, and historic structures within a state scenic highway and local scenic routes and protected public viewsheds. Therefore, this impact (AES-2) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

From 2035 to 2050, regional population is forecasted to increase by 125,725 people, 61,433 housing units, and 164,843 jobs. As shown in Figure 2-19, regional land use and development changes are evident by 2050. The increased density can be seen when comparing the existing housing density to the 2050 housing density, as shown in Figures 2-11 and 2-12, respectively. Similar to buildout conditions in 2035, areas of increased residential density by 2050 are projected within existing established communities such as the City of San Diego communities of Downtown, Kearny Mesa, Midway Pacific Highway, Mission Valley, and University Center. New development is also expected in the north coastal corridor between Del Mar and MCB Camp Pendleton; the area between MCB Camp Pendleton and I-15; the corridor along SR 78 between Vista and San Marcos; northeast of I-15 and Escondido; the SR 56 corridor; and along Carmel Valley and Poway. In the South Bay, development is projected adjacent to SR 125 in the Otay Ranch area, SR 11 in East Otay Mesa, and along the SR 94 and I-8 corridors. Regional growth is expected in the unincorporated areas of North County Metro and Otay, but will decrease in the unincorporated communities of Alpine, Ramona, Valley, Lakeside, and Fallbrook.

Local scenic resources and public viewsheds within a state scenic highway, as discussed in the 2025 analysis, may be affected by regional growth and land use change projected to occur in 2050. This regional growth and land use change would result in adverse visual impacts related to implementation of projects along eligible and designated scenic highways and local scenic routes and protected public viewsheds. Impacts would occur where development detracts from or diminishes the elements that contribute to the scenic nature of the highway, including trees, rocks, outcroppings, and historic bridges and structures within a state scenic highway corridor or local scenic routes and protected public viewsheds. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

Planned transportation network improvements by 2050 include the 5 Big Moves as described above and include the development of Complete Corridors, Transit Leap, Mobility Hubs, Flexible Fleets and Next Operating Systems. By 2050, additional transportation network improvements would occur in the San Diego region as part of the proposed Plan. The proposed Plan includes the construction of new rail and transit facilities by 2050, such as the completion of commuter rail service from Sorrento Mesa to National City via UTC, Kearny Mesa, and University Heights (CR 582); Oceanside to downtown San Diego via Sorrento Mesa and UTC tunnels and stations at Balboa Avenue (CR 398); commuter rail service from the Central Mobility Hub to the U.S. border via downtown San Diego (CR 583); and commuter rail service from downtown San Diego to El Cajon via SDSU and La Mesa (CR 581). The SPRINTER rail lines would be extended from Escondido to the Westfield North County ~~Fair~~Shopping Center. The extension of the new commuter rail lines would largely extend through highly urbanized corridors in the North County, South Bay, and East County. New commuter rail service

between Oceanside and Downtown and Downtown San Diego to El Cajon, would occur adjacent to and be visible from vehicles traveling on state-eligible scenic highways such as I-5 and portions of I-8.

Major transportation network improvements by 2050 include additional Managed Lanes and ramp improvements along portions of I-5, SR 15 and I-15, I-805, SR 52, SR 54, SR 56, SR 94, SR 163, SR 125, and SR 905; rural highway improvements along I-8, SR 94, SR 76, and SR 79 would consist of intersection improvements and shoulder widening. Roadway improvements also include goods movement support with Harbor Drive multimodal corridor improvements and the Otay Mesa POE pedestrian bridge. By 2050, active transportation projects include buildout of the San Luis Rey River Trail and bikeway trails in the Encinitas–San Marcos corridor; Camp Pendleton Trail; I-15 Bikeway; SR 56 Bikeway; SR 52 Bikeway, I-8 Corridor Trail; I-805 corridor; SR 905 corridor; El Camino Real Bike Lanes; Carlsbad to San Marcos corridor; Mira Mesa corridor; Mid-County Bikeway; Central Coast corridor; downtown San Diego to Southeast San Diego corridor; San Diego River Bikeway; Kearney Mesa to Beaches corridor; and several enhanced bike lanes through Santee, El Cajon, La Mesa, and unincorporated San Diego County.

Potential impacts on scenic resources and public viewsheds would occur with planned transportation improvements in the northern coastal communities. Scenic resources include the coastal corridor with views of local beaches and the ocean; various estuaries and lagoons such as Buena Vista, Agua Hedionda, and Batiquitos Lagoons; the agricultural fields in Carlsbad; San Dieguito River; and Peñasquitos Lagoon. Highway improvements along SR 54, SR 67, SR 94. and SR 125 would occur in proximity to local scenic resources and public viewsheds with views of trees and rock outcroppings.

Transportation improvements are planned on three designated and five eligible scenic highways. Table 4.1-6 lists the scenic highways in the San Diego region that would be affected by implementation of the 2050 transportation projects provided in the proposed Plan, identifies the proposed improvements, and includes the impact that would occur.

Table 4.1-6
Transportation Network Improvements Relative to Designated or Eligible Scenic Highways (2050)

Scenic Route	Proposed Improvement	Impact
I-5 (E)	LOSSAN rail double-tracking, commuter rail, additional Managed Lanes, roadway widening, freeway connector, and Mobility Hubs including: Carlsbad Palomar, Carlsbad Village, Carmel Valley, Encinitas, La Jolla, Oceanside, Pacific Beach, and Solana Beach.	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
I-8 (E)	Interchange/intersection improvements	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
SR 52 (E) (D)	Roadway widening, Managed Lanes	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
SR 94 (E)	Freeway connections, Managed Lanes, roadway widening	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings

Scenic Route	Proposed Improvement	Impact
SR 76 (E)	Facility improvements, intersection improvements, straightening	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings
SR 78 (D)	Arterial improvements, Mobility Hubs including Escondido	New construction may impede or block scenic resources
SR 125 (D)	Managed Lanes, direct access routes	Cut-and-fill activities may cause substantial damage to scenic resources, such as trees, rocks, and outcroppings

(E) = eligible for designation as a scenic highway; (D) = officially designated as a scenic highway

The proposed Plan's 2050 transportation network improvements would damage scenic resources, including, but not limited to trees, rock outcroppings, and historic sites within a state scenic highway and local scenic routes and protected public viewsheds. Due to the location of these transportation network improvements along scenic highways and affecting local scenic resources and public viewsheds, this would be a significant impact.

2050 Conclusion

Implementation of regional growth and land use change and transportation network improvements would result in new development and infrastructure affecting scenic resources, including trees, rock outcroppings, and historic structures within a state scenic highway, and local scenic routes and protected public viewsheds. Therefore, this impact (AES-2) in the year 2050 is significant.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan has the potential to exacerbate climate change effects on scenic resources. The proposed Plan would result in increased development and thus increased impervious surfaces, which could worsen flooding that is already expected to intensify under climate change. The proposed Plan could also result in more development in high fire-risk areas, increasing wildfire risk due to the higher chance of ignitions from human sources. Both increased flooding and wildfire risk can destroy vegetation, exacerbate erosion, and damage scenic resources like trees, rocks, outcroppings, and historic structures within a state scenic highway.

MITIGATION MEASURES

AES-2 SUBSTANTIALLY DAMAGE SCENIC RESOURCES, INCLUDING BUT NOT LIMITED TO, TREES, ROCKS, OUTCROPPINGS, AND HISTORIC STRUCTURES WITHIN A STATE SCENIC HIGHWAY

2025, 2035, and 2050

Implementation of mitigation measure **AES-1a** as discussed under Impact AES-1 will also reduce impacts to scenic resources.

AES-2a Reduce Impacts on Scenic Resources within a State Scenic Highway and Local Scenic Resources for Transportation Network Improvements. During planning, design, and project-level CEQA review of transportation network improvements within eligible or designated state scenic highways and local scenic

resources, SANDAG shall, and other transportation project sponsors can and should, ensure that projects are designed to minimize damage to scenic resources.

The following measures would reduce the significant effects related to damage of scenic resources within a state scenic highway or other scenic resource or a local scenic route that are in the jurisdiction and responsibility of Caltrans or other public agencies. Where a project has the potential for significant effects, mitigation measures shall ensure compliance with regulations for Caltrans scenic vistas, requirements of the Coastal Act, and policies within county and city general plans. Such measures may include the following:

- Use a palette of colors, textures, and building materials that are graffiti-resistant, and/or plant materials that complement the surrounding landscape and development.
- Use contour grading to better match surrounding terrain. Contour edges of major cut-and-fill to provide a more natural looking finished profile.
- Use alternating façades to "break up" large façades and provide visual interest.
- Design new corridor landscaping to respect existing natural and human-made features and to complement the dominant landscaping of the surrounding areas.
- Replace and renew landscaping along corridors with road widenings, interchange projects, and related improvements.
- Retain or replace trees bordering highways, so that clear-cutting is not evident.
- Provide new corridor landscaping that provides appropriate transition to existing natural and human-made features and is complementary to the dominant landscaping or native habitats of surrounding areas.
- Prohibit planting or seeding of invasive plant species that appear on the most recent version of the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory.
- Avoid, if possible, large cuts and fills when the visual environment (natural or urban) would be substantially disrupted. Site or design of projects should minimize their intrusion into important viewsheds and use contour grading to better match surrounding terrain.

AES-2b Reduce Impacts on Scenic Resources within a State Scenic Highway and Local Scenic Resources for Development Projects. During planning, design, and project-level CEQA review of development projects, the County of San Diego, cities, and other local jurisdictions can and should incorporate measures that ensure that projects are designed to reduce impacts on scenic resources within eligible and designated state scenic highways, coastal areas, and local scenic resources. Measures include, but are not limited to, the following:

- Avoid damaging, moving, or removing trees, rock outcroppings, historic structures, and other scenic resources from eligible or designated state scenic highway corridors and local scenic resources and public viewsheds, where those scenic resources are relevant to the designation or eligibility for designation as a state scenic highway or are identified as a protected visual resource in local plans. For projects within or adjacent to designated or eligible state scenic highway corridors, and local scenic resources and public viewsheds identified in local approved plans, prior to project approval, complete visual resources studies. If a significant impact on scenic resources is identified, the study would require site-specific mitigation measures, which may include those identified below.
- Apply development standards and guidelines to maintain compatibility with surrounding natural areas, including site coverage, building height and massing, building materials and color, landscaping, and site grading.

- Ensure vegetation used as screening and landscaping blends in and complements the natural landscape.
- Retain or replace trees within scenic resources so that clear-cutting is not evident.
- Ensure grading blends with the adjacent landforms and topography.
- Prohibit planting or seeding of invasive plant species that appear on the most recent version of the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of mitigation measures AES-1a, AES-2a, and AES-2b would reduce significant impacts on scenic resources, including resources within a state scenic highway and local scenic routes and protected public viewsheds. However, some of the growth and land use change, and transportation network improvements are located in areas where damage, movement, or removal of trees, rocks, outcroppings, and other scenic resources cannot be avoided, such as improvements on state-designated SR 52 and SR 125, and eligible scenic highways I-5, SR 76, SR 52, I-8, and SR 94. It cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, this impact (AES-2) would remain significant and unavoidable.

AES-3 SUBSTANTIALLY DEGRADE THE EXISTING VISUAL CHARACTER OR QUALITY OF PUBLIC VIEWS OF THE SITE AND ITS SURROUNDINGS, INCLUDING ADDING A VISUAL ELEMENT OF URBAN CHARACTER TO AN EXISTING RURAL OR OPEN SPACE AREA, CONFLICTING WITH REGULATIONS GOVERNING SCENIC QUALITY.

ANALYSIS METHODOLOGY

This analysis provides a description of the existing visual character of areas that would experience forecasted regional growth and land use change or planned transportation network improvements under the proposed Plan and describes how the proposed Plan would affect the visual character of these areas. Visual changes are described for areas where forecasted regional growth and land use change or planned transportation network improvements are proposed, including adding a visual element of urban character to an existing rural or open space area. Visual regulations and policies governing scenic quality (refer to Table 4.1-3) are analyzed for their ability to reduce visual impacts. A significant impact on the visual character or the quality of public views of the site and its surroundings would occur when forecasted regional growth and land use change or planned transportation network improvements associated with the proposed Plan would result in a substantial negative visual effect or otherwise degrade the existing visual character and quality of the project sites and/or their surroundings as viewed from public areas.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

By 2025, the region is forecasted to increase by 161,338 people, 97,661 housing units, and 115,328 jobs. New development caused by regional growth and land use change would include new housing units, services, commercial areas, industrial centers, schools, and civic uses. Concentrated growth is also expected to occur around the planned Mobility Hubs throughout the region. While some growth would be in the form of new

developments or communities, such as in the City of San Diego communities of Mission Valley West and East (SDSU West and Aztec Stadium) and in eastern Chula Vista and East Otay Mesa, a substantial portion of new growth also would occur within existing established communities such as the City of San Diego communities of the College Area, Midway-Pacific Highway, Kearny Mesa, and University Center, and the cities of National City, Chula Vista, Escondido, and San Marcos, and in rural communities in the unincorporated County such as North County Metro and Otay.

Scenic vistas that would be affected by new development include the long-range views of the coastal mountain ranges and habitat preserves; unobstructed views of the Pacific Ocean from the Pendleton-De Luz area; and views of highly scenic lagoons and waterways such as Batiquitos, Agua Hedionda, Buena Vista, San Elijo, and Los Peñasquitos Lagoons, and the San Dieguito and San Luis Rey Rivers along the I-5 corridor. Scenic vistas in the South Bay area include the Otay River, Sweetwater River Valley, upper and lower Otay Lakes, the Sweetwater Reservoir, and San Diego Bay. In the East County, scenic resources include large open space parks, preserves, mountain ranges, and reservoirs.

Development of these communities would change the visual character throughout the region, both in beneficial and adverse ways. Most of the new land development that would result from regional growth and land use change by 2025 would occur within and adjacent to areas that are currently urbanized. Infill development occurs in highly urbanized areas and affects the character of existing communities (e.g., increased densities, scale and bulk, and height of buildings), resulting in viewshed character changes or light and shadow impacts. Some intensification of development would occur in some of the more outlying communities, such as Vista, Escondido, Poway, Santee, Ramona, El Cajon, La Mesa, and Lemon Grove. In these areas, there would be some conversion of undeveloped lands, as well as infill in already developed areas of the communities. Visual character changes would occur because the infill developments are larger than those that currently exist in the communities and have the potential to transform the surrounding community from existing rural to more urban. Local jurisdictions have general plan policies, zoning ordinances, other ordinances, and additional regulations/policies such as design guidelines in place to protect visual character and quality within their jurisdictions. As listed in Table 4.1-3, various jurisdictions have adopted visual regulations that require all development to adhere to standards that address bulk, mass, articulation, height, and transition issues (such as the interface with surrounding or adjacent development and uses) and reduce negative impacts on the community. Visual policies also ensure exclusion of incompatible uses and structures, and preserve and enhance scenic resources present in adjacent areas. While some infill development projects would cause adverse visual character impacts in urban areas, the policies and regulations presented in Table 4.1-3 would assure there would be no substantial degradation of visual character.

While some of the land development projects associated with the proposed Plan are located in areas where they would not substantially change surrounding visual character, those in some outlying and less urbanized areas would substantially degrade the visual character of an area, including adding a visual element of urban character to an existing rural or open space area. Therefore, impacts of regional growth and land use change on visual character would be significant.

Transportation Network Improvements and Programs

Planned transportation network improvements by 2025 include the 5 Big Moves as described in Chapter 2. Major corridor improvements include portions of the LOSSAN rail corridor double-tracking, continued improvement of Managed Lanes on I-5, new toll lanes on SR 11 to the Otay Mesa POE, interchange and arterial operational improvements at SR 94 and SR 125.

Some of the improvements in the proposed Plan by 2025 would involve only operational changes that would not require construction of new transportation or transit facilities, such as increasing service frequencies or new transit routes within existing right-of-way. These changes would generally not lead to impacts on the visual character of a project area.

Most of the planned transportation improvements would be minor and involve enhancements to existing facilities, so permanent visual changes would be limited. The proposed Plan includes active transportation projects, with improvements such as safe routes to transit at all new transit stations, and development of various bikeways throughout the region. Additionally, the proposed Plan identifies transit service improvements in 2025; however, these improvements do not require major infrastructure development, so they would not have a substantial effect on the visual character of the surrounding areas.

Regional arterial improvements on existing local roadways in Carlsbad and Chula Vista would involve relatively minor impacts on visual character because of their location in generally urban environments. However, adverse impacts would occur if proposed alignments or facilities require large cut-and-fill slopes or sound attenuation barriers, whether in previously undeveloped areas or already developed urban areas. Roadway widening in the rural parts of the region near SR 67, Ramona, and Otay Lakes Road would affect rural vistas or change the character of existing views. Careful alignment and design, collaboration with local jurisdictions and conformance with local grading ordinances to ensure compatibility with surrounding development would reduce visual character impacts. In urbanized areas, roadways and ancillary improvements, such as soundwalls, introduced by transportation network improvements and programs would result in adverse visual character impacts, depending on the scale of improvements and location of sensitive viewers, including the driving public; users of gathering places, rest areas, and vista points; and a large number of residents who live around resources. Depending on location, new Managed Lanes and park-and-ride lots would result in some loss of existing freeway landscaping. Although the above transportation network improvements generally occur in urbanized environments, they would substantially degrade the visual character of an area, depending upon the nature of the improvements and the location of sensitive viewers. Therefore, impacts of transportation network improvements on visual character would be significant.

2025 Conclusion

By 2025, regional growth and land use change and transportation network improvements would substantially degrade visual character, including adding visual elements of urban character to existing rural or open space areas. Therefore, this impact (AES-3) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

From 2025 to 2035, regional population is forecasted to increase by 149,500 people; housing by 121,650 units; and employment by 159,728 jobs. As shown in Figure 2-18, regional land use and development changes are evident by 2035. The community planning areas in the City of San Diego that show the highest growth in jobs are Downtown, Kearny Mesa, and Otay Mesa. However, in terms of percent growth, Chula Vista and San Marcos are forecasted to grow by 50 percent or more. Areas of increased residential density by 2035 are projected within existing established communities such as the City of San Diego communities of Downtown, Kearny Mesa, Midway-Pacific Highway, Otay Mesa, and Mission Valley. Established communities in Chula Vista, San Marcos, and Escondido are also expected to see increased density. By 2035, some regional growth would be accommodated in the northern and eastern rural areas of the region including North County Metro and Otay. Development in these areas would be located mostly along highway corridors, such as I-5, SR 76, SR 78, I-15,

I-805 east of Chula Vista, and SR 11, and generally within San Diego County community planning areas. Regional growth and land use change would include some conversion of undeveloped lands, although there would be a focus on infill development within the existing communities, all of which would change visual character. Urban centers in the western third of the San Diego region would have most available land developed with single- and multi-family uses, commercial and office uses, and industrial uses. Consistent with the goals of the proposed Plan, the dense growth within existing urban centers with high accessibility to transit options allows for the creation of communities that are more sustainable, walkable, transit-oriented, and compact.

In more urbanized areas, changes in visual character would also occur, as remaining undeveloped properties are developed and infill occurs. Visual character changes would occur because the infill developments are larger than those that currently exist surrounding the communities and have the potential to transform the surrounding community from existing rural to more urban. Local jurisdictions have general plan policies, zoning ordinances, other ordinances, and additional regulations/policies such as design guidelines in place to protect visual character and quality within their jurisdictions. As listed in Table 4.1-3, various jurisdictions have adopted visual regulations that require all development to adhere to standards that address bulk, mass, articulation, height, and transition issues such as the interface with surrounding or adjacent development and uses, and reduce negative impacts on the community. Visual policies also ensure exclusion of incompatible uses and structures, and preserve and enhance scenic resources present in adjacent areas. While some infill development projects would cause adverse visual character impacts in urban areas, these policies and regulations would assure there would be no substantial degradation of visual character. Some of the regional growth and land use change associated with the proposed Plan is located in areas where it would not substantially affect the surrounding visual character. However, regional growth and land use change in outlying and less urbanized areas would substantially degrade the visual character of an area, including adding a visual element of urban character to an existing rural or open space area. Therefore, impacts related to the degradation of visual character would be significant.

Transportation Network Improvements and Programs

Planned transportation network improvements by 2035 include the 5 Big Moves as described above and include the development of Complete Corridors, Transit Leap, Mobility Hubs, Flexible Fleets and Next Operating Systems. The proposed Plan includes the construction of new rail and transit facilities by 2035, such as the development of commuter rail service from Sorrento Mesa to National City via UTC, Kearny Mesa, and University Heights (CR 582); and commuter rail service from Oceanside to Downtown, including a tunnel in Del Mar, and stations at the Central Mobility Hub and Camp Pendleton (CR 398). Improvements also include an Automated People Mover at the Central Mobility Hub and an additional anchor mobility hub at the San Ysidro Transit Center (San Ysidro Mobility Hub). The proposed Plan includes double-tracking and several grade separation projects in 2035 for the LOSSAN, SPRINTER, and Trolley. Double and third-tracking and rail grade separations include the Blue Line, Orange Line, and Green Line through the South Bay and East County communities. New commuter rail service between Oceanside and Downtown would occur adjacent to scenic resources and could result in the degradation of visual character along this corridor.

Active transportation improvements by 2035 include development of various bikeways throughout the region, including bikeway improvements to the Coastal Rail Trail and the Bayshore Bikeway. Transit service improvements to be constructed by 2035 include increases in service for the COASTER, extensions and increases in service of the Trolley, and several new rapid transit routes. Due to the highly urbanized nature of the area surrounding these improvements, degradation of visual character would not occur.

The proposed Plan contains four transportation network improvements on the arterial roadway system by 2035. These projects include addition of new lanes and Class II bicycle lanes along Carlsbad Boulevard in the City of Carlsbad; new travel lanes and bicycle lanes and pedestrian pathways in the community of Ramona; bridge widening, new ramps, and realignment of existing ramps at Palm Avenue/SR 805 in the South Bay; and new interchange and roadway improvements at SR 78. Impacts related to visual character would occur along these roadways. Adverse visual character impacts would occur in these rural areas because roadway widening would introduce visual elements of urban character to an existing rural area such as Ramona and the inland communities along SR 78.

In urbanized areas, roadways and ancillary improvements, such as soundwalls, introduced by transportation network improvements may also result in adverse visual character impacts depending on the scale of improvements and location of sensitive viewers, including the driving public; users of gathering places, rest areas, and vista points; and a large number of residents who live around resources.

Although the transportation network improvements and programs described above would generally occur in urbanized environments, they would substantially degrade the visual character of an area, depending upon nearby sensitive viewers. Transportation network improvements would cause a significant impact.

2035 Conclusion

By 2035, implementation of the proposed Plan would result in regional growth and land use change and transportation network improvements that would substantially degrade visual character, including adding visual elements of urban character to existing rural or open space areas. Therefore, this impact (AES-3) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

From 2035 to 2050, regional population is forecasted to increase by 125,725 people, 61,433 housing units, and 164,843 jobs. As shown in Figure 2-19, regional land use and development changes are evident by 2050. The increased density can be seen when comparing the existing housing density to the 2050 housing density, as shown in Figures 2-11 and 2-12 respectively. Similar to buildout conditions in 2035, areas of increased residential density by 2050 would be apparent within existing established communities such as the City of San Diego communities of Downtown, Kearny Mesa, Midway Pacific Highway, Mission Valley, and University Center. New development is also projected in the north coastal corridor between Del Mar and MCB Camp Pendleton; the area between MCB Camp Pendleton and I-15; the corridor along SR 78 between Vista and San Marcos; northeast of I-15 and Escondido; the SR 56 corridor; and along Carmel Valley and Poway. In the South Bay, development is expected to occur adjacent to SR 125 in the Otay Ranch area, SR 11 in East Otay Mesa, and along the SR 94 and I-8 corridors. Regional growth is projected in the unincorporated areas of North County Metro and Otay, but is expected to decrease in the unincorporated communities of Alpine, Ramona, Valley, Lakeside, and Fallbrook.

Regional growth and land use change by 2050 would include some conversion of undeveloped lands, although there would be a focus on infill development within the existing communities, all of which would change visual character.

In more urbanized areas, changes in visual character would also occur, as remaining undeveloped properties are developed and infill occurs. Local jurisdictions have general plan policies, zoning ordinances, other ordinances, and additional regulations/policies such as design guidelines in place to protect visual character

and quality within their jurisdictions. As listed in Table 4.1-3, various jurisdictions have adopted visual regulations that require all development to adhere to standards that address bulk, mass, articulation, height, and transition issues (such as the interface with surrounding or adjacent development and uses), and reduce negative impacts on the community. Visual policies also ensure exclusion of incompatible uses and structures, and preserve and enhance scenic resources present in adjacent areas. While some infill development projects would cause adverse visual character impacts in urban areas, these policies and regulations would assure there would be no substantial degradation of visual character.

Some of the regional growth and land use change associated with the proposed Plan is located in areas where it would not substantially change the surrounding visual character. However, in outlying and less urbanized areas regional growth and land use change would substantially degrade the visual character of an area, including adding a visual element of urban character to an existing rural or open space area. Therefore, impacts related to the degradation of visual character would be significant.

Transportation Network Improvements and Programs

Planned transportation network improvements by 2050 include the 5 Big Moves as described above and include the development of Complete Corridors, Transit Leap, Mobility Hubs, Flexible Fleets and Next Operating Systems. The proposed Plan includes the construction of new rail and transit facilities by 2050, such as the completion of commuter rail service from Sorrento Mesa to National City via UTC, Kearny Mesa, and University Heights (CR 582); Oceanside to downtown San Diego via Sorrento Mesa and UTC tunnels and stations at Balboa Avenue (CR 398); commuter rail service from the Central Mobility Hub to the U.S. border via downtown San Diego (CR 583); and commuter rail service from downtown San Diego to El Cajon via SDSU and La Mesa (CR 581). The SPRINTER rail lines would be extended from Escondido to the Westfield North County ~~Fair~~Shopping Center. The extension of the new commuter rail lines would largely extend through highly urbanized corridors in the North County, South Bay, and East County. New commuter rail service between Oceanside and Downtown and Downtown San Diego to El Cajon, would occur adjacent to local scenic resource and may lead to visual degradation of the area.

Major transportation network improvements by 2050 include additional Managed Lanes and ramp improvements along portions of I-5, SR 15 and I-15, I-805, SR 52, SR 54, SR 56, SR 94, SR 163, SR 125, and SR 905; rural highway improvements along I-8, SR 94, SR 76, SR 79 would consist of intersection improvements and shoulder widening. By 2050, active transportation projects include buildout of the San Luis Rey River Trail and bikeway trails in the Encinitas–San Marcos corridor; Camp Pendleton Trail; I-15 Bikeway; SR 56 Bikeway; SR 52 corridor, I-8 corridor Trail; I-805 corridor; SR 905 corridor; El Camino Real Bike Lanes; Carlsbad to San Marcos corridor; Mira Mesa corridor; Mid-County Bikeway; Central Coast corridor; downtown San Diego to Southeast San Diego corridor; San Diego River Bikeway; Kearney Mesa to Beaches corridor; and several enhanced bike lanes through Santee, El Cajon, La Mesa, and unincorporated San Diego County. Increases in transit service on existing operating transit modes would not result in an adverse change in visual character to the communities as the facilities already exist and the community is adapted to the transit mode passing through the area.

Proposed improvements to existing facilities and construction of new highways, roadways, and other transit facilities would create adverse visual impacts by adding visual elements of urban character to existing rural or open spaces. This would occur where new alignments or improvements to existing facilities would pass through primarily rural, agricultural, and/or open space areas, and the contrast would result in substantial degradation of visual character. These generally would occur along the I-5 corridor, north of Oceanside, along

SR 76, east of the I-15 to Couser Canyon, on I-15 between SR 78 and SR 76, along SR 56, along SR 67, on SR 94 east of SR 125, and along SR 125 south of SR 54.

In urbanized areas, roadways and ancillary improvements such as soundwalls introduced by transportation network improvements and programs may also result in adverse visual character impacts depending on the scale of improvements and location of sensitive viewers, including the driving public; users of gathering places, rest areas, and vista points; and a large number of residents who live around such visual resources. Highway widening and the construction of Managed Lanes may result in some loss of existing freeway landscaping. Although the above transportation network improvements generally occur in urbanized environments, they would substantially degrade the character of an area, depending upon nearby sensitive viewers. Transportation network improvements would cause a significant impact.

2050 Conclusion

By 2050, implementation of the proposed Plan would result in regional growth and land use change and transportation network improvements that would substantially degrade the region's visual character, including adding visual elements of urban character to existing rural or open space areas. Therefore, this impact (AES-3) in the year 2050 is significant.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects on the existing visual character and quality of the public views in the region. While both the proposed Plan and climate change could result in effects to existing visual character and quality, the proposed Plan is not expected to interact with climate change in a way that would worsen the climate change effects.

MITIGATION MEASURES

AES-3 SUBSTANTIALLY DEGRADE THE EXISTING VISUAL CHARACTER OR QUALITY OF PUBLIC VIEWS OF THE SITE AND ITS SURROUNDINGS, INCLUDING ADDING A VISUAL ELEMENT OF URBAN CHARACTER TO AN EXISTING RURAL OR OPEN SPACE AREA, CONFLICTING WITH REGULATIONS GOVERNING SCENIC QUALITY.

2025, 2035, and 2050

Implementation of mitigation measures **AES-1a**, **AES-2a**, and **AES-2b** discussed under Impact AES-1 and AES-2 would also reduce impacts related to degradation of existing visual character.

AES-3a Reduce Impacts on Visual Character for Transportation Network Improvements. During planning, design, and project-level CEQA review of transportation network improvements, SANDAG shall, and other transportation project sponsors can and should, incorporate measures that ensure that projects are designed to reduce significant impacts on visual character. Measures include, but are not limited to, the following:

- Use contour grading to match surrounding terrain and existing natural, and human-made features of the area.
- Revegetate graded slopes and exposed earth surfaces prior to completion of construction.
- Prohibit planting or seeding of invasive plant species that appear on the most recent version of the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory.

- Construct permanent barriers (e.g., soundwalls, safety barriers, retaining walls) of materials whose color and texture or treatment (e.g., landscaping cover) complements the surrounding landscape and development. Break up large barrier façades using techniques that include, but are not limited to, color, texture, landscaping, see-through safety barriers, and alternating façades.

AES-3b Reduce Impacts on Visual Character for Development Projects. During planning, design, and project-level CEQA review of development projects the County of San Diego, cities, and other local jurisdictions can and should incorporate measures that ensure that projects are designed to reduce significant impacts on visual character. Measures include, but are not limited to, the following:

- Use contour grading to match surrounding terrain and existing natural, and man-made features of the area.
- Revegetate graded slopes and exposed earth surfaces prior to completion of construction.
- Construct permanent barriers (e.g., soundwalls, safety barriers, retaining walls) of materials whose color and texture or treatment (e.g., landscaping cover) complements the surrounding landscape and development. Break up large barrier façades using techniques that include, but are not limited to, color, texture, landscaping, see-through safety barriers, and alternating façades.
- Apply development standards and design guidelines to maintain compatibility with surrounding development, including site coverage, building height and massing, building materials and color, landscaping, and site grading.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of mitigation measures AES-1a, AES-2a, AES-2b, AES-3a, and AES-3b would reduce significant impacts associated with the degradation of visual character. However, while these mitigation measures reduce changes in visual character, it would be infeasible to prevent all instances of substantial degradation of visual character caused by regional growth and land use change as well as transportation network improvements. It cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, substantial degradation of visual character would remain significant and unavoidable.

AES-4 SUBSTANTIALLY DEGRADE THE EXISTING VISUAL CHARACTER OR QUALITY OF PUBLIC VIEWS OF THE SITE AND ITS SURROUNDINGS BY CREATING A NEW SOURCE OF LIGHT AND GLARE THAT WOULD ADVERSELY AFFECT DAY OR NIGHTTIME VIEWS.

ANALYSIS METHODOLOGY

This section analyzes impacts from light and glare. In regards to forecasted regional growth and land use change, additional sources of light and glare may come from development in outlying communities or conversion of undeveloped lands to more urban uses. Relevant policies and ordinances are analyzed for their ability to reduce light and glare impacts. A significant impact could occur if the introduction of these new lighting or glare sources would shed substantial light onto adjacent, light-sensitive property or land use; would emit a substantial amount of ambient light into the nighttime sky or areas with existing dark skies; would create a new source of substantial glare that would affect daytime views; or would adversely alter the visual character of the area. Uses considered sensitive to nighttime light include, but are not limited to, residential uses, some commercial and industrial uses, observatories, and natural areas (see Section 4.4, *Biological Resources,* for a

discussion on the impacts of light and glare on biological resources). Therefore, the analysis considers if regional growth and changes in land use would create new lighting sources that would result in the generation of a substantial amount of light onto adjacent, light-sensitive property or land use, or would emit a substantial amount of ambient light into the nighttime sky or areas with existing dark skies.

Transportation network improvement projects (which include improvements or lane additions) may also result in additional vehicles on the roadways and in additional street lights, intersection control devices, reflective signage, and reflective roadway materials that increase the total amount of illumination or glare in an area in such a way as to degrade day or nighttime views, which would result in a significant impact related to substantial light or glare. A qualitative analysis of impacts is provided by assessing the location of proposed major transportation network improvement projects in relationship to areas with low levels of nighttime lighting, including areas with dark skies.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

By 2025, new development described above would result in additional sources of light and glare, which in some locations would result in adverse impacts on the region's dark skies. Lighting requirements are guided by standards set by local jurisdictions. Typical measures include the use of downward-directed low-pressure sodium vapor lighting. Such requirements aid in the preservation of dark-sky conditions, which are essential for local observatories to operate. New development would be required to comply with the applicable lighting standards, and the location, type, and direction of the lighting. A lighting plan is typically required to be submitted to planning departments during the development review process to show illumination levels and point of intersection between fixtures, as well as use of low-pressure sodium vapor exterior lighting. However, adherence to lighting standards may not be applicable to all types of development projects, and dark skies impacts may occur in some areas. As such, impacts would be significant.

Transportation Network Improvements and Programs

Planned transportation network improvements by 2025 include the 5 Big Moves as described in Chapter 2. Major corridor improvements include portions of the LOSSAN rail corridor double-tracking, continued improvement of Managed Lanes on I-5, new toll lanes on SR 11 to the Otay Mesa POE, and interchange and arterial operational improvements at SR 94 and SR 125. As discussed above, most of the planned transportation improvements would be minor and involve enhancements to existing facilities, so permanent visual changes related to light and glare would be limited. Active transportation and transit service improvements in 2025 are also not likely to require major infrastructure development, so they would not have a substantial effect on light and glare in the surrounding areas. However, projects that include improvements of freeways, toll roads, Mobility Hubs, and the East Otay Mesa POE would likely add new lighting components that in some locations would adversely affect dark skies. Additionally, projects with lane additions and improvements that would increase traffic on roadways would experience additional light sources from vehicle headlights at night, which in some more rural locations would adversely affect dark skies, resulting in a significant impact.

~~Indirect impacts to sensitive species, and wildlife corridors in proximity to locations of transportation network improvements could occur as a result of additional light sources. New lighting components and additional sources of light from vehicle headlights could affect the habitat value for some species, particularly for nocturnal species by modifying predation rates, obscuring lunar cycles, and by causing direct habitat~~

~~avoidance. These impacts are discussed in more detail in Section 4.4, *Biological Resources.* Mitigation measure BIO-2a includes design, minimization, and avoidance measures for special-status animal species, including measures to minimize lighting impacts during construction and operation and maintenance measures. Mitigation measure BIO-3, which is intended to facilitate wildlife movement and reduce identified significant impacts to movement of fish or wildlife species or established native resident or migratory wildlife corridors, includes design measures to minimize lighting in areas near corridors. Impacts to sensitive species and wildlife corridors are identified as significant and unavoidable, as there is no assurance that mitigation measures identified in Section 4.4, *Biological Resources* would be implemented for all projects or equally effective due to the wide variety of circumstances, complexity of some sites, and complexity of impacts on them.~~

2025 Conclusion

By 2025, regional growth and land use changes as well as transportation network improvements would create new light sources from new development and vehicle headlights at night that would adversely affect dark skies in some locations. Therefore, this impact (AES-4) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

By 2035, the regional growth and land use changes described above would result in additional sources of light and glare. Lighting requirements are guided by standards set by local jurisdictions. Typical measures include the use of downward-directed low-pressure sodium vapor lighting. Such requirements aid in the preservation of dark-sky conditions, which are essential for local observatories to operate. New development would be required to comply with the applicable lighting standards regarding the location, type, and direction of the lighting. A lighting plan is typically required to be submitted to planning departments during the development review process to show illumination levels and point of intersection between fixtures, as well as the use of low-pressure sodium vapor exterior lighting. However, adherence to lighting standards may not be applicable to all types of development projects, and dark skies impacts may occur in some areas. As such, impacts would be significant.

Transportation Network Improvements and Programs

Active transportation improvements by 2035 include development of various bikeways throughout the region, including bikeway improvements to the Coastal Rail Trail and the Bayshore Bikeway. Transit service improvements to be constructed by 2035 include increases in service for the COASTER, extensions and increases in service of the Trolley, and several new rapid transit routes. Other rail improvements would include the Del Mar Tunnel and the associated inland rail relocation and bluff restoration, and increases in Amtrak and freight rail service. Due to the highly urbanized nature of the area surrounding these improvements, substantial sources of additional lighting and glare would not occur.

Two new Managed Lanes along SR 78 from I-5 to Twin Oaks Road would be added, which would result in new sources of light and glare. The proposed Plan also features four transportation network improvements on the arterial roadway system in 2035. These projects include the addition of new lanes and Class II bicycle lanes along Carlsbad Boulevard in the City of Carlsbad; new travel lanes and bicycle lanes and pedestrian pathways in the community of Ramona; bridge widening, new ramps, and realignment of existing ramps at Palm Avenue/SR 805 in the South Bay; and new interchange and roadway improvements at SR 78. Impacts related to additional lighting would occur along these roadways. Additionally, transportation improvements in the community of Ramona and the more rural area near SR 78 would result in a noticeable increase in light sources at night, which would adversely affect dark skies. However, projects with lane additions and improvements

that would increase traffic on roadways would experience additional light sources from vehicle headlights at night, which in some more rural locations would adversely affect dark skies, resulting in a significant impact.

2035 Conclusion

By 2035, regional growth and land use changes as well as transportation network improvements would create new light sources from new development and vehicle headlights at night that would adversely affect dark skies in some locations. Therefore, this impact (AES-4) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

Regional growth and land use change by 2050 would include some conversion of undeveloped lands, although there would be a focus on infill development within the existing communities, all of which would change visual character. This would also result in additional sources of light and glare, which would have significant impacts on the region's dark skies. However, adherence to lighting standards may not be applicable to all types of development projects, and dark skies impacts may occur in some areas. As such, impacts would be significant.

Transportation Network Improvements and Programs

Proposed improvements to existing facilities and construction of new highways, roadways, and other transit facilities would create additional sources of light and glare. This would occur where new alignments or improvements to existing facilities would pass through primarily rural, agricultural, and/or open space areas, and the contrast would result in the introduction of new light and glare sources. These generally would occur along the I-5 corridor north of Oceanside, along SR 76 east of the I-15 to Couser Canyon, on I-15 between SR 78 and SR 76, along SR 56, along SR 67, on SR 94 east of SR 125, and along SR 125 south of SR 54. However, projects with lane additions and improvements that would increase traffic on roadways would experience additional light sources from vehicle headlights at night, which in some more rural locations would adversely affect dark skies, resulting in a significant impact.

2050 Conclusion

By 2050, regional growth and land use changes as well as transportation network improvements would create new light sources from new development and vehicle headlights at night that would adversely affect dark skies in some locations. Therefore, this impact (AES-4) in the year 2050 is significant.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects on light and glare as there are no projected impacts of climate change on light and glare.

MITIGATION MEASURES

AES-4 **SUBSTANTIALLY DEGRADE THE EXISTING VISUAL CHARACTER OR QUALITY OF PUBLIC VIEWS OF THE SITE AND ITS SURROUNDINGS BY CREATING A NEW SOURCE OF LIGHT AND GLARE THAT WOULD ADVERSELY AFFECT DAY OR NIGHTTIME VIEWS.**

2025, 2035, and 2050

AES-4a Minimize Effects of Light and Glare for Transportation Network Improvements. During planning, design, project-level CEQA review, and construction of transportation network improvements, SANDAG shall, and other transportation project sponsors can and should, ensure that projects avoid or minimize the effects of light and glare on routes of travel for motorists, cyclists, and pedestrians, or on adjacent properties, and limit expanded areas of shade and shadow to areas that would not adversely affect open space or outdoor recreation areas.

Where SANDAG and other transportation project sponsors have identified that a project has the potential for significant effects, they can and should adopt mitigation measures to ensure consistency with the goals and policies within county and city general plans, as applicable. Construction and operational measures include, but are not limited to, the following:

- Minimize and control glare from transportation projects through the adoption of project design features that reduce glare, such as those listed below:
  - Planting trees along transportation corridors to reduce glare from the sun.
  - Landscaping off-street parking areas, loading areas, and service areas.
  - Limiting the use of reflective materials, such as metal.
  - Using non-reflective material, such as paint, vegetative screening, matte finish coatings, and masonry.
  - Screening parking areas by using vegetation or trees.
  - Using low-reflective glass.
- Impose lighting standards that ensure that minimum safety and security needs are addressed and minimize light trespass and glare associated with transportation network improvements. These standards include the following:
  - Minimizing incidental spillover of light onto adjacent private properties and undeveloped open space.
  - Directing luminaries away from habitat and open space areas adjacent to the project site.
  - Installing luminaries that provide good color rendering and natural light qualities.
  - Minimizing the potential for back scatter into the nighttime sky and for incidental spillover of light onto adjacent private properties and undeveloped open space.

AES-4b Minimize Effects of Light and Glare for Development Projects. During planning, design, project-level CEQA review, and construction of development projects, the County of San Diego, cities, and other local jurisdictions can and should ensure that projects avoid or minimize the effects of light and glare on routes of travel for motorists, cyclists, and pedestrians, or on adjacent properties, and limit expanded areas of shade and shadow to areas that would not adversely affect open space or outdoor recreation areas. Where a project has the potential for significant effects, mitigation measures shall ensure consistency with the goals and policies within county and city general plans, as applicable. Such measures may include, but are not limited to, the following:

- Use lighting fixtures that are adequately shielded to a point below the light bulb and reflector and that prevent unnecessary glare onto adjacent properties.
- Restrict the operation of outdoor lighting for construction from the hours of 7:00 p.m. to 7:00 a.m.

- Use high pressure sodium vapor and/or cut-off fixtures including LED lights, instead of typical mercury-vapor fixtures for outdoor lighting.
- Use unidirectional lighting to avoid light trespass onto adjacent properties.
- Provide structural and/or vegetative screening from light-sensitive uses.
- Shield and direct all new street and pedestrian lighting away from light-sensitive offsite uses.
- Use non-reflective glass or glass treated with a non-reflective coating for all exterior windows and glass used on building surfaces.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of mitigation measures AES-4a, and AES-4b, would reduce significant impacts associated with the introduction of new light and glare sources. However, while these mitigation measures reduce light and glare impacts, it would be infeasible to prevent all instances of new light and glare sources caused by regional growth and land use change as well as transportation network improvements, particularly from additional light sources from vehicle headlights at night. It cannot be guaranteed that all future project-level impacts related to light and glare can be mitigated to less-than-significant levels. Impacts would remain significant and unavoidable.

4.2 AGRICULTURAL AND FORESTRY RESOURCES

This section evaluates the impacts of the proposed Plan on agricultural and forestry resources.

4.2.1 EXISTING CONDITIONS

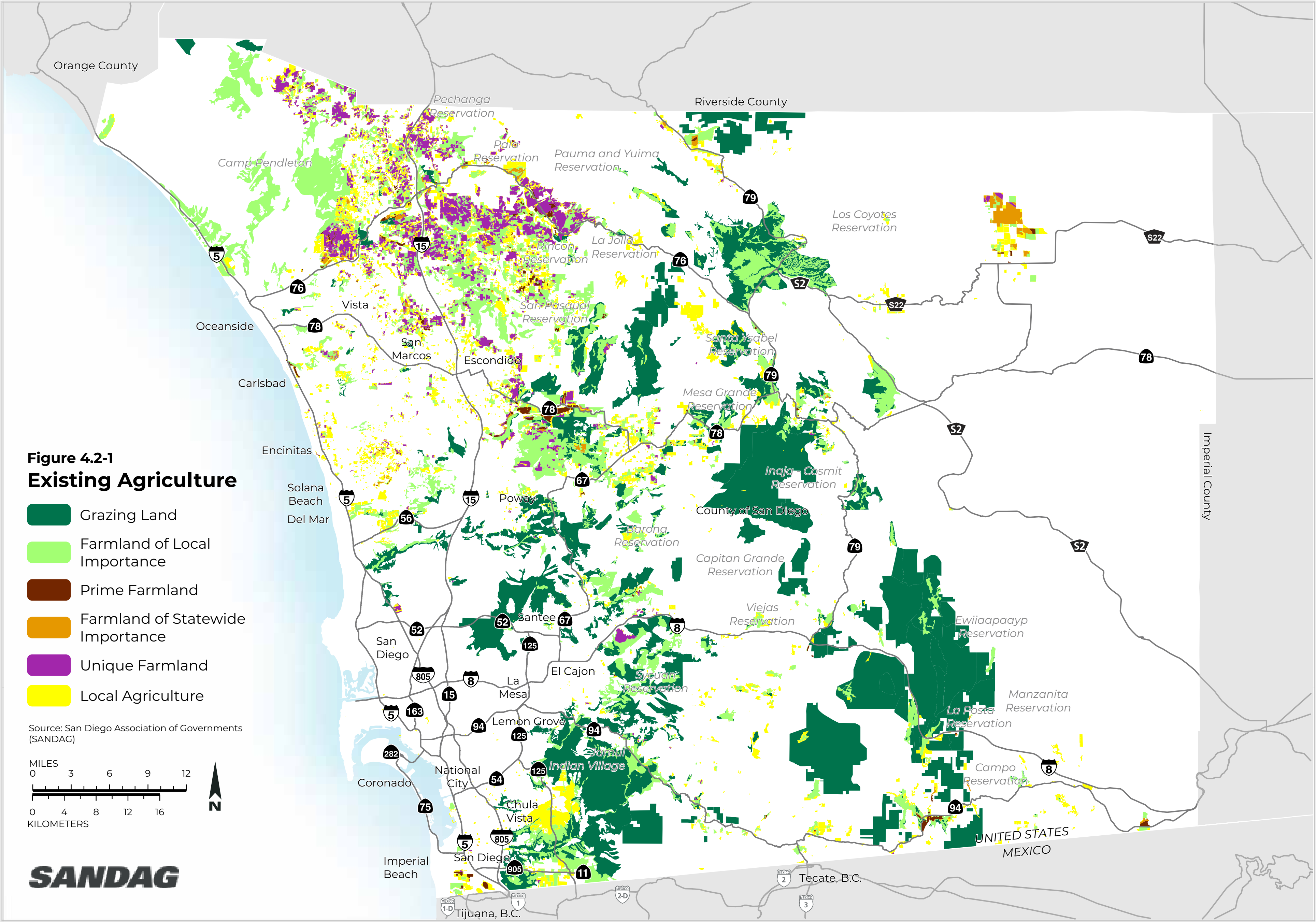
AGRICULTURAL RESOURCES

Agriculture is one of California's major industries, and the state produces a significant portion of the nation's food supplies (CDFA 2017). The San Diego region plays an important part, having the 12th largest farm economy among more than 3,000 counties nationwide (San Diego County Farm Bureau 2018). Farming in the San Diego region, however, differs from much of the rest of California, with more small farms than any other county (San Diego County Farm Bureau 2018). As the southwestern most part of the state, the San Diego region has a subtropical climate that optimizes production of a variety of crops that may be more difficult to produce elsewhere. The value of agricultural production in the San Diego region in 2016 was over $1.74 billion, with contributions from nursery and cut flower products, fruits and nuts, vegetables, and timber products, among others (County of San Diego 2016). In addition to production value, agriculture contributed a total of $2.88 billion to the economy of the San Diego region and supported 16,648 jobs (County of San Diego 2015).

Existing Agriculture and Farmlands

SANDAG compiled data available from the sources and years listed below to represent existing conditions for farmland in the San Diego region. Existing agricultural and farmlands parcels of all sizes are identified on Figure 4.2-1.

- SANDAG Land Use (2016) – this set of agricultural data resources includes grazing lands (field crops, grazing lands) and croplands (intensive agriculture, orchards and vineyards, and truck crops) (SanGIS 2016).
- San Diego County Agriculture Weights and Measures Agriculture Commodities Data (2020) – this database represents field border boundaries of agricultural commodity production sites throughout the region.
- Existing vegetation communities mapping described in Section 4.4, *Biological Resources,* and Appendix E of this EIR – these data include an agricultural lands category (SanGIS 2021).
- State of California Department of Conservation (DOC) FMMP (2016) – these data identify land classified under CEQA as "agricultural land", which includes the following land use categories: Prime Farmlands, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Lands.


Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
County of San Diego
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Jamul Indian Village
Campo Reservation
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
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SANDAG

Figure 4.2-1
Existing Agriculture

- Grazing Land
- Farmland of Local Importance
- Prime Farmland
- Farmland of Statewide Importance
- Unique Farmland
- Local Agriculture

As shown in Table 4.2-1, there are approximately 566,214 acres of existing agriculture and farmland in the San Diego region. Grazing lands account for about 281,461 acres (50 percent) of agricultural lands and are distributed throughout the San Diego region. General agriculture, field crops, and truck crops tend to be in the northern portion of the San Diego region and in the northeast portions of the unincorporated County. Orchard and vineyards are concentrated in the north along Interstate 15.

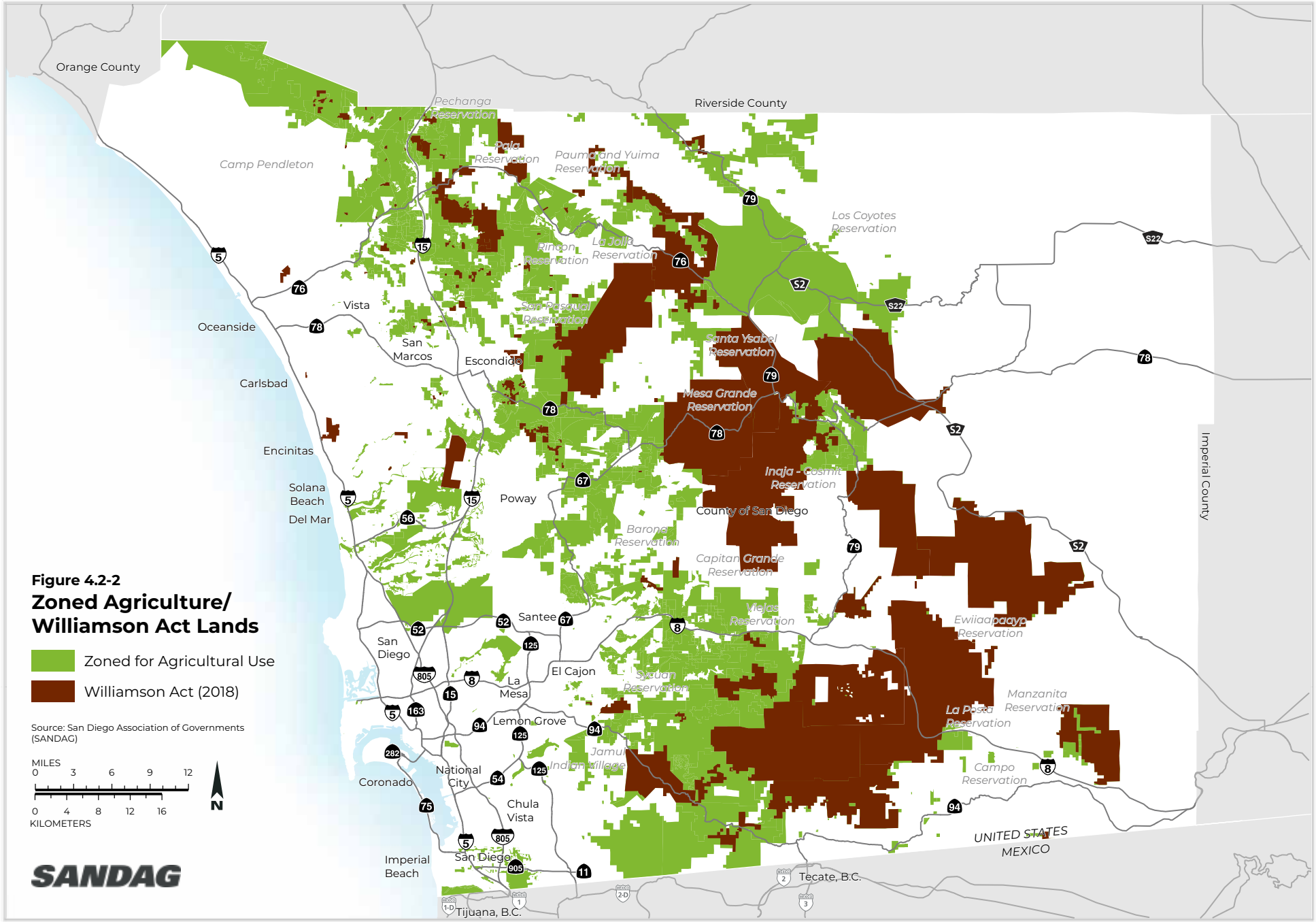
Table 4.2-1
Existing Agricultural Lands in the San Diego Region

Agricultural Category	Acreage
Prime Farmland	5,320
Farmland of Statewide Importance	7,431
Unique Farmland	40,986
Total FMMP-designated Agricultural Land Under CEQA	**53,737**
Farmland of Local Importance	157,682
Grazing Lands	281,461
Local Agricultural Land Outside of FMMP	73,334
Other Farmland	512,477
Total	**566,214**

Source: SANDAG 2021a, 2021b.

Existing Agricultural Zoning and Williamson Act Lands

Agricultural zoning and Williamson Act contracts help preserve agricultural lands in the region. Existing zoning information was obtained from applicable general plans, and includes lands allowed for various types of agricultural operations (Figure 4.2-2). There are 769,202 acres of lands zoned as agricultural in San Diego County (County of San Diego 2021).


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
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Barona Reservation
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Viejas Reservation
Ewiiaapaayp Reservation
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Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Camp Pendleton
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.2-2
Zoned Agriculture/ Williamson Act Lands
Zoned for Agricultural Use
Williamson Act (2018)
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments that are much lower than normal because they are based upon farming and open space uses as opposed to full market value. As of 2017, the most recent available data, the San Diego region contains 80,572 acres of lands designated under the Williamson Act (SanGIS 2017). Figure 4.2-2 shows Williamson Act designated lands in the San Diego region (these lands are also zoned for agriculture). As shown on Figure 4.2-2, Williamson Act lands are generally located in the eastern portions of the County of San Diego along State Route (SR) 78, SR 79, and SR 76.

Public agencies may acquire Williamson Act contracted land for a wide range of public improvements. Common reasons for publicly acquiring contracted land include conversion to wildlife habitat, water resource management, public open space, and schools. Public acquisitions have been the second leading source of contract termination acreage over the current decade. Before acquiring contracted lands, a public agency must make findings that there is no other noncontracted land reasonably feasible for the purpose, and that the lower cost of contracted land is not a primary factor in its decision.

FORESTRY RESOURCES

Existing Timberland

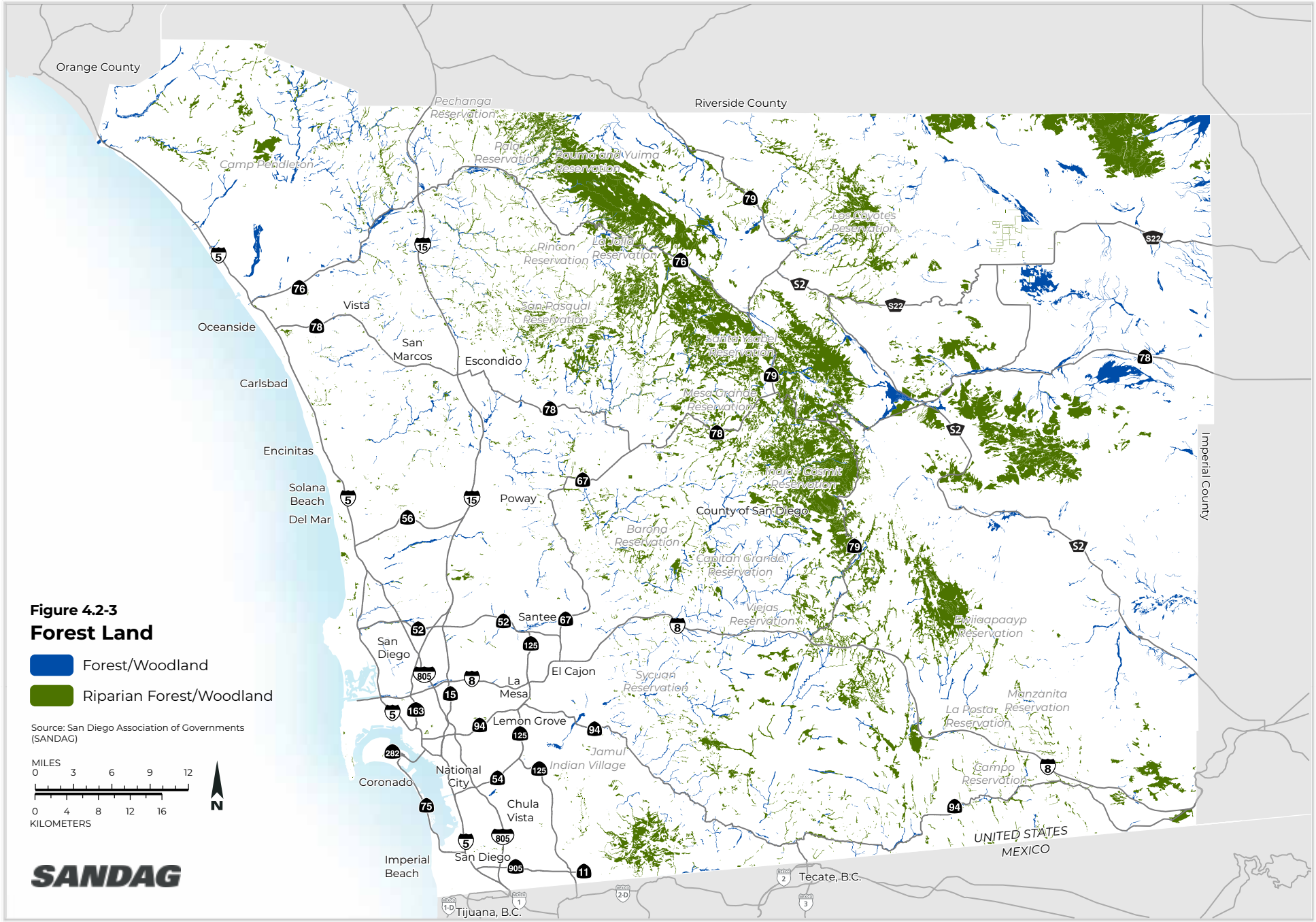
The California Timberland Productivity Act of 1982 (Government Code Section 51100 et seq.) defines timberland as privately owned land, or land acquired for state forest purposes, which is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, and which is capable of growing an average annual volume of wood fiber of at least 15 cubic feet per acre. A Timberland Production Zone (TPZ) is an area zoned and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses. Compatible uses include those that do not significantly detract from the use of the property for, or inhibit, growing and harvesting timber.

The San Diego region does not contain any land designated as timberland or TPZ (County of San Diego 2006).

Existing Forest Land

California Public Resources Code (PRC) Section 12220(g) defines “forest land” as land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits. Forest vegetation communities in the San Diego region include riparian forest/woodland and upland forest/woodland; these vegetation communities are located mainly in the coastal and montane subregions of the San Diego region.

Based on the most recent available vegetation data, the San Diego region contains a number of areas that are considered forest land, totaling 307,595 acres (County of San Diego 2021). Figure 4.2-3 shows lands designated as forest land in the San Diego region. A number of state and national parks in the region also contain designated forest land.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
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Solana Beach
Del Mar
Poway
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Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.2-3
Forest Land
Forest/Woodland
Riparian Forest/Woodland
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
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SANDAG

The majority of forest land is located in parks and vacant and undeveloped areas located east of incorporated cities and urbanized communities. A few areas with forest lands are also located near urban centers. National and state parks with forest resources include the Torrey Pines State Natural Reserve, Cleveland National Forest, Agua Tibia Wilderness, San Mateo Canyon Wilderness, Palomar Mountain State Park, and Cuyamaca Rancho State Park. The following sections describe national and state parks or preserved areas that contain designated forest land.

Torrey Pines State Natural Reserve

Torrey Pines State Natural Reserve, located within the City of San Diego, has more than 2,000 acres of rare native Torrey pine forest and southern maritime chaparral. Recreational uses are managed by the State Parks system. The trees themselves were identified in the mid-1800s as a separate species of pine, and one that grows naturally only along a small strip of coast from Del Mar to La Jolla and on Santa Rosa Island, which lies off the coast about 170 miles to the northwest. The Torrey pine is the rarest pine in the United States and one of the rarest pines in the world. All of the natural features in the reserve are protected by law (Torrey Pines State Natural Reserve 2018).

The Cleveland National Forest

The Cleveland National Forest is the southernmost National Forest in California. Consisting of 460,000 acres, the forest offers a wide variety of terrains and recreational opportunities. Portions of the Cleveland National Forest are located in the unincorporated areas of San Diego County, in three noncontiguous areas, as well as in Orange and Riverside counties. Damaging or removing any tree or forest product except as authorized by a special-use authorization, timber sale contract, or federal law or regulation is prohibited (USFS 2018a).Agua Tibia Wilderness

The Agua Tibia Wilderness is a 17,979-acre protected wilderness[1] area in Riverside and San Diego counties, mostly within the Palomar Ranger District of the Cleveland National Forest (Martin 1990). The Agua Tibia Wilderness comprises 480 acres of Bigcone Douglas-fir–canyon live oak forest. The Aqua Tibia Wilderness was set aside for the study of this forest type in the Peninsular Range province and with emphasis on forest succession, long-range ecological changes, and the effects of resource management practices.

San Mateo Canyon Wilderness

The San Mateo Canyon Wilderness contains 39,413 acres within San Diego and Orange Counties and is managed by the U.S. Forest Service (Aldo Leopold Wilderness Research Institute et al. 2018). The mountains in the wilderness are primarily covered by chaparral and coastal sage vegetation. The area includes several hiking and horse-riding trails with camping available (U.S. Forest Service 2018b).

[1] Wilderness is an official designation under the Wilderness Act of 1964. Wilderness areas are designated for preservation and protection and are managed by federal land management agencies such as the National Park Service and U.S. Forest Service (National Park Service 2018a, 2018b).

Palomar Mountain State Park

Coniferous forests cover much of the 1,862 acres of Palomar Mountain State Park, located in north San Diego County (CSP 2018a). Palomar Mountain State Park has a long history of use as a resort and camping destination, but logging operations have never been fully developed (Beckler and Brueggeman 2014).

Cuyamaca Rancho State Park

Cuyamaca Rancho State Park is a state park located 40 miles east of San Diego in the Laguna Mountains of the Peninsular Ranges. The park's 26,000 acres feature pine, fir, and oak forests, with meadows and streams that exist due to the relatively high elevation of the area compared to its surroundings. The park includes the 6,512-foot Cuyamaca Peak, the second highest point in San Diego County (CSP 2018b).

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

The San Diego region is likely to experience sea level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and drier springs and autumns, a 12 percent decrease in runoff and streamflow due to less snowpack and greater evaporation, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix C.

Climate change may limit the availability and viability of agricultural land due to higher temperatures, reduced availability of water for irrigation, changed pest regimes, and destructive events like wildfire. Forests could also be negatively affected by high temperatures and wildfire, especially when these effects are combined with land use changes and poor management. In addition to potentially reducing agricultural and forest viability and production rates, climate change impacts on plant growth and soil microbial communities may also negatively impact soil carbon storage rates and levels (Bradford et al. 2016, Ren et al. 2020).

Higher temperatures may worsen crop yield and quality, decrease the number of pollinators available, decrease the number of "chill hours" needed for some crops to grow, increase evapotranspiration, and increase the spread of crop pests and diseases (Gonzalez et al. 2018). Higher temperatures can also cause heat stress on livestock, spread livestock diseases, or require higher costs in cooling livestock; all these may reduce livestock and dairy production (Bright et al. 2018).

Water supplies and irrigation may be constrained in the San Diego region due to fewer rainy days and a decrease in runoff and streamflow, as well as longer and more intense droughts. Effects such as reduced snowpack and precipitation, as well as more precipitation falling as rain rather than snow in the mountains, can decrease water supplies coming from the mountain ranges. These effects reduce the amount of runoff and streamflow from melted snow, potentially decreasing this source of water. Such changes have already affected the Colorado River, which has seen a decline in streamflow by 16.5 percent between 1916 and 2014; over half of this decline can be attributed to warming temperatures (Xiao et al. 2018). A shift in the timing of melting snowpack can also affect supplies (CEP and SDF 2015). This snowpack usually melts in the spring and summer, releasing water when it is most needed; however, snow has melted earlier in recent years, reducing the amount of water available later in the year (Reidmiller et al. 2018). By 2100, snow water equivalent is expected to decline to less than one-half of its historical average under Representative Concentration Pathways (RCP) 4.5 and less than one-third of the historical average under RCP 8.5 (Bedsworth et al. 2018). This projected difference in seasonal water availability can affect crop yield and quality, especially for crops that are more sensitive to the timing of rainfall and irrigation (Gonzalez et al. 2018).

Using the Cal-Adapt wildfire tool, the County of San Diego estimates a 40 percent increase in annual average acres of burned land by 2100 compared to the annual average between 1950 and 2005 under a high-emissions scenario (County of San Diego 2018). Rainstorms are projected to be heavier by 2050, which may result in more soil erosion. Furthermore, the increase in atmospheric carbon dioxide from climate change could spread weeds (Reidmiller et al. 2018). Thus, climate change is expected to have a negative impact on agricultural resources in the San Diego region.

Impacts of climate change can also result in conversion, or loss, of forest land. Forest lands in the San Diego region face some of the same threats listed for agriculture, including higher temperatures, wildfire, pests, drought, and flooding (Bright et al. 2018). In California, land use and forest management practices have led to the growth of trees that are less resilient to drought and wildfire (Bright et al. 2018). Certain tree species in Southern California, such as conifer forests, are especially vulnerable—warmer and drier climates in the past have increased the burn area of these forests by 650 percent. Wildfires in the southwestern United States can also convert forest to woodland or grassland (Melillo et al. 2014) and may have a positive feedback cycle on climate change by decreasing levels of carbon sequestration. Forests in the United States absorb and hold about 16 percent of the carbon dioxide emitted in the country per year; burning this wood releases this carbon back into the atmosphere (Melillo et al. 2014). Warm temperatures and drought can also increase the spread of insect attacks, such as bark beetles, which have already killed off 102 million trees in California since 2010 (Bright et al. 2018). Although climate change is expected to have a negative impact on forestry resources in the San Diego region, these consequences have not yet been quantified.

4.2.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Farmland Protection Policy Act of 1981

Congress passed the Agriculture and Food Act of 1981 (Public Law 97-98) containing the Farmland Protection Policy Act (FPPA) (7 U.S.C. 4202(a)), which is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. The objective of the FPPA is to ensure that—to the extent possible—federal programs are administered to be compatible with state and local units of government, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every 2 years (USDA 2018).

Federal Forest Legacy Program

The objective of the Federal Forest Legacy Program is to identify and protect environmentally important forest lands that are threatened by present or future conversion to nonforest uses (USDA 2017). Priority is given to lands that can be effectively protected and managed and that have important scenic, recreational, timber, riparian, fish and wildlife, threatened and endangered species, and other cultural and environmental values. The program is entirely voluntary. Landowners who wish to participate may sell or transfer particular rights, such as the right to develop the property or to allow public access, while retaining ownership of the property and the right to use it in any way consistent with the terms of the easement. The agency or organization holding the easement is responsible for managing the rights it acquires and for monitoring compliance by the landowner. Forest management activities, including timber harvesting, hunting, fishing, and hiking are encouraged, provided that they are consistent with the program's purpose.

The Federal Forest Legacy Program is not solely a protection program. Eligible properties may be "working forests," where forest land is managed for the production of forest products and traditional forest uses are maintained. These forest uses will include both commodity outputs and non-commodity values. The purpose of these easements is to maintain these forests intact to provide such traditional forest benefits as timber production, wildlife habitat, watershed protection, and/or open space. These forests remain in private ownership, except for the restrictions on development or other uses conveyed by the conservation easement to the agency selected by the landowner.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

Right to Farm Act

The Right to Farm Act (Civil Code Section 3482.5) is designed to protect commercial agricultural operations from nuisance complaints that may arise when an agricultural operation is conducting business in a "manner consistent with proper and accepted customs." The code specifies that established operations that have been in business for 3 or more years that were not nuisances at the time they began will not be considered a nuisance as a result of a new land use.

California Coastal Act

The California Coastal Act requires the protection of agricultural lands within the coastal zone. It does so by directly mandating that the maximum amount of prime agricultural land be maintained in production, and by supporting various techniques to limit threats to agricultural productivity. These include establishing stable urban-rural boundaries, agricultural buffers, development priority on lands not suitable for agriculture, subdivision restrictions, and public service expansion controls (PRC Section 30241).

California Farmland Conservancy Program

The California Farmland Conservancy Program (CFCP) (PRC Section 10200 et seq.) was formerly known as the Agricultural Land Stewardship Program, which began in 1995. The CFCP provides grants for agricultural conservation easements with the intent to encourage the long-term, private stewardship of agricultural lands through the voluntary use of agricultural conservation easements. The CFCP provides grants to local governments and qualified nonprofit organizations. Easements funded by the CFCP must be of a size and nature suitable for viable commercial agriculture. An agricultural conservation easement is a voluntary, legally recorded deed restriction placed on a property used for agricultural production. The easements are held by land trusts or local governments. The goal is to maintain agricultural land in active production by removing the development pressures from the land. Such easements prohibit practices that would damage or interfere with the agricultural use of the land. Because the easement is a restriction on the deed of the property, the easement remains in effect even when the land changes ownership. While other benefits may accrue because the land is not developed (scenic and habitat values, for example), the primary use of the land is agricultural.

California Land Conservation Act (Williamson Act)

The California Land Conservation Act, better known as the Williamson Act, creates incentives designed to retain agricultural preserves, which can include areas devoted to agricultural use and related open space (Government Code Sections 51200–51297.4). The minimum term for Williamson Act contracts between the local government and participating landowners is 10 years (DOC 2018a). The initial term of 10 years renews automatically each year (local governments can establish initial contract terms for longer periods of time). Generally, any commercial agricultural use will be permitted within any agricultural preserve; however, the

Williamson Act also permits land devoted to recreational use and open space, as defined in Government Code Section 51201, within an agricultural preserve. Allowable recreational uses include walking, hiking, picnicking, camping, swimming, boating, fishing, hunting, or other outdoor games or sports available for public participation.

The Williamson Act also includes Farmland Security Zone (FSZ) provisions. An FSZ is an area created within an agricultural preserve by a local government upon request by one or more landowners. FSZ contracts offer landowners greater property tax reduction in return for an initial contract term of 20 years, with renewal occurring automatically each year. Land restricted by an FSZ contract is valued for property assessment purposes at 65 percent of its Williamson Act valuation, or 65 percent of its Proposition 13 valuation, whichever is lower. New special taxes for urban-related services must be levied at an unspecified reduced rate unless the tax directly benefits the land or living improvements. Cities and special districts that provide nonagricultural services are generally prohibited from annexing land enrolled under an FSZ contract. Similarly, school districts are prohibited from taking FSZ lands for school facilities.

Payments under the Open Space Subvention Act intended to provide for the partial replacement of local property tax revenue foregone as a result of participation in the Williamson Act have been suspended since 2010 due to revenue shortfalls.

Farmland Mapping and Monitoring Program

The Farmland Mapping and Monitoring Program (FMMP) produces maps and statistical data used for analyzing impacts on California's agricultural resources. Agricultural land is rated according to soil quality and irrigation status; the best quality land is classified as Prime Farmland. The maps are updated every 2 years with the use of a computer mapping system, aerial imagery, public review, and field reconnaissance. The goal of the FMMP is to provide consistent and impartial data to decision makers for use in assessing present status, reviewing trends, and planning for the future of California's agricultural land resources (DOC 2018b).

Cortese-Knox-Hertzberg Local Government Reorganization Act

The Cortese-Knox-Hertzberg Local Government Reorganization Act (Government Code Sections 56000 et seq.) establishes procedures for local government changes of organization, including city incorporations, annexations to a city or special district, and city and special district consolidations. This act's policies provide that development or use of land for any purpose other than open space should be redirected from existing prime agricultural lands in open space use toward areas containing nonprime agricultural lands, unless that action would not promote the planned, orderly, efficient development of an area. In the San Diego Region, this act is implemented by the San Diego Local Agency Formation Commission (LAFCO).

California Department of Forestry and Fire Protection's Fire and Resource Assessment Program

The California Department of Forestry and Fire Protection's (CAL FIRE's) Fire and Resource Assessment Program (FRAP) accesses the amount and extent of California's forest and rangelands. The program analyzes their condition and identifies alternative management and policy guidelines. The assessment links together State requirements for natural resource inventories and strategies and the federal government's desire to rely more heavily on these State programs in determining priorities for funding (CAL FIRE 2018a).

Open Space Subvention Act

The Open Space Subvention Act (OSSA, Government Code Sections 16140 et seq.) was enacted on January 1, 1972, to provide for the partial replacement of local property tax revenue foregone as a result of participation in the Williamson Act and other enforceable open space restriction programs. Through 2009, participating local governments received annual payments of foregone property tax revenues on the basis of the quantity (number of acres), quality (soil type and agricultural productivity), and, for FSZ contracts, location (proximity to a city) of land enrolled under eligible enforceable open space restrictions (DOC 2018c). However, these payments have been suspended since 2010 due to revenue shortfalls.

California Forest Legacy Act

The California Forest Legacy Act (CFLA, PRC Sections 12200 et seq.) was enacted in 2000 and extended in 2007. The CFLA allows CAL FIRE to acquire conservation easements, and permit federal agencies, State agencies, local governments, and nonprofit land trust organizations to hold conservation easements acquired pursuant to the California Forest Legacy Program. The California Forest Legacy Program provides funding for conservation easements, with the objective to protect the forest land base, as well as forest resources such as fish and wildlife habitat and water quality, while ensuring the continuance of traditional uses and protection of landowners' property rights. Landowners participating in the programs are required to prepare a multi-resource management plan that is the equivalent of, or more extensive than, a Forest Stewardship Plan (per U.S. Forest Service guidelines) (CAL FIRE 2018b).

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

Cities in the proposed Plan Area and the County of San Diego, when applicable, have adopted general plans and zoning regulations that address agricultural lands and forestry. The local regulations, plans, and policies, related to preservation of lands designated for agricultural uses in the region are provided in Table 4.2-2.

Table 4.2-2
Local Agriculture Regulations, Policies, or Programs

Jurisdiction	Regulation, Policy, or Program
Carlsbad	The City of Carlsbad Local Coastal Program protects agricultural lands from premature conversion to urban land uses by establishing programs that require mitigation for conversion of agricultural property to urban uses. It also establishes methods to benefit agriculture in the community by providing financial assistance through cash programs. General Plan Policies 4-P.44 Allow and encourage farming operations to continue within the Cannon Road Open Space, Farming, and Public Use Corridor (such as the strawberry fields) as long as they are economically viable for the landowner. 4-P.45 Ensure the existing Flower Fields remain a farming and flower production use by utilizing all available methods and programs, including grants and other outside financial assistance. 4-P.46 Utilize available methods and resources to reduce the financial burdens on agricultural land, not only to prevent premature development, but also to encourage its continued use for agricultural purposes. 4-P.47 Ensure new development adjacent to an agricultural use is sensitive to the continuation of the agricultural use by requiring appropriate design criteria, such as site layout, use of vegetation and buffers.

Jurisdiction	Regulation, Policy, or Program
	4-P.48 Encourage soil and water conservation techniques in agricultural activities. 4-P.49 Ensure that the grading of agricultural lands is accomplished in a manner that minimizes erosion of hillsides and minimizes stream siltation and to maintain the appearance of natural hillsides and other land forms wherever possible. 4-P.50 Prevent agricultural run-off and other forms of water pollution from entering the storm drain system and polluting the city's water bodies. 4-P.51 Prior to the approval of new development within an existing or former agricultural area in Carlsbad, require a detailed soils testing and analysis report be prepared by a registered soils engineer and submitted to the city and the county health department for review and approval. This report shall evaluate the potential for soil contamination due to historic use, handling, or storage of agricultural chemicals restricted by the County of San Diego Department of Health Services. If hazardous chemicals are detected at concentrations in the soil that would have a significantly adverse effect on human health, the report shall identify a range of possible mitigation measures to remediate the significant public health impacts. The Carlsbad Community Forest Management Plan, provides guidance to conserve forest areas through proper design, maintenance and education. The document includes guidelines and procedures for planting, maintaining, removing, replacing and preserving trees within public areas.
Chula Vista	The Otay Ranch General Development Plan, approved jointly by the City of Chula Vista and County of San Diego for the future development of Otay Ranch, establishes goals, objectives, policies, and implementation measures relative to the protection of agricultural resources. The Range Management Plan for Otay Ranch recommendations and implementing actions are provided for ongoing managed grazing activities on conveyed lands if the activity is shown not to negatively affect biological resources. General Plan Policies: E 4.1 Allow historical agricultural uses to continue within planned development areas as an interim land use in accordance with the MSCP Subarea Plan. E 4.2 Allow agricultural uses on privately-owned property within the Chula Vista Greenbelt and elsewhere, provided the use is consistent with the provisions of the Chula Vista MSCP Subarea Plan, as well as the zoning of the property. E 4.3 Encourage the development of community gardens and similar related uses within appropriate, compatible locations throughout the City.
Coronado	No applicable agricultural regulations, policies, or programs. According to the General Plan, there are no agricultural lands under production in the city and no forests.
Del Mar	No applicable agricultural regulations, policies, or programs.
El Cajon	The City of El Cajon does not have any lands designated for agricultural use but allows limited agricultural uses in large residential zones and open space zones. According to the General Plan, there are no forests in the city.
Encinitas	The Agricultural Overlay Zone restricts development on properties presently under a Williamson Act contract and described on the city map delineating the Agricultural Overlay Zone to that which is necessary for agricultural operations. The Land Use Element of the General Plan contains a policy that specific plans will not be approved unless the exclusive agriculture use of the land is no longer feasible, or to allow development on portions of the plan area that will enhance the feasibility of agriculture use of the remaining portions of the area.

Jurisdiction	Regulation, Policy, or Program
	The Encinitas Ranch Specific Plan contains policies to ensure the economic viability of agricultural uses in the planning area and preserve sufficient land area so as to ensure the financial viability of agriculture on the property and the continued operation of the Paul Ecke Ranch.
Escondido	City of Escondido General Plan policies: Agricultural Resources Policy 4.1 Maintain large-lot residential land uses with appropriate zoning designations in agricultural areas that are compatible with preserving agricultural productivity. Agricultural Resources Policy 4.2 Require agricultural lands to be physically separated from more intensive urban development with intermediate land uses that are mutually compatible, and use landscape screening methods to minimize urban and agricultural conflicts. Agricultural Resources Policy 4.3 Explore a variety of techniques to preserve existing agricultural lands including: a) Agricultural Land Trusts designed as nonprofit corporations organized according to the Nonprofit Public Benefit Corporation Law of California and Section 501(c)(3) of the Internal Revenue Code. b) Transfer development rights from existing agricultural lands to other portions of the project or City-approved receiver sites, thereby preserving the agricultural lands in permanent open space, consistent with clustering policies. c) The "right to farm" in open space areas. Agricultural Resources Policy 4.4 Encourage the use of water conservation techniques in agricultural enterprises including the use of reclaimed water for irrigation. Agricultural Resources Policy 4.5 Support the operation of, and provide venues for, "Certified Farmer's Markets" to allow farmers in the area to sell their products on-site or off-site as designated locations. Agricultural Resources Policy 4.6 Permit the development of community gardens on vacant properties in commercial and industrial areas and multi-family neighborhoods, provided that they are managed and operated to prevent adverse impacts on adjoining uses.
Imperial Beach	No land within Imperial Beach is designated for agricultural use.
La Mesa	No applicable agricultural regulations, policies, or programs.
Lemon Grove	No applicable agricultural regulations, policies, or programs.
National City	The City of National City General Plan policies: OS-3.3: Encourage the development of unused land such as portions of parks and utility right of ways to be converted to productive space for growing food. OS-3.5: Identify potentially feasible site locations for urban agriculture, including locations for street conversions, and identify links between them. OS-3.8: Maintain an on-going dialogue with the community to ensure that its needs are being addressed by urban agriculture endeavors. OS-3.11: Explore opportunities for the planting of fruit trees and gardens in the public right-of-way, where feasible.
Oceanside	City of Oceanside General Plan policies: 2.5 B: Residential development shall be permitted provided such development does not interfere with existing agricultural operations and that the open space character of the area is preserved. Appropriate minimum lot areas shall be determined by the area's topography, adjacent land uses, and the availability of public services and utilities; however, under no circumstances shall lot areas be less than two and one-half (2½) acres. Lot configurations and dimensions shall

Jurisdiction	Regulation, Policy, or Program
	provide areas of sufficient size to conduct limited, low-intensity agricultural activities such as orchards, gardens, and the keeping of livestock. 2.5 C: The City shall, in all proposed actions converting agricultural lands to other land uses, consider the loss of those lands to the potential agricultural productivity to the community; and shall assure that land use compatibility to agricultural lands is fully defined and assured. 2.5 D: Land use compatibility is of primary importance to agricultural areas, since land use conflicts between agricultural and nonagricultural uses can force the economic non-viability of agricultural areas.
Poway	The City of Poway General Plan contains a policy to allow agriculture on lands designated Open Space – Resource Management (OS-RM) with approval of the City Council. The General Plan encourages the combination of agriculture and residential uses in High Valley and parts of Green Valley. The General Plan states that numerous areas are lightly developed with activities or facilities that serve the region as unique or outstanding recreational safety or managed production (agriculture, mineral extraction areas). These areas should be retained as open space and in some cases increased to serve the region's expanding needs.
City of San Diego	City of San Diego General Plan policies: CE-L.1. Manage agricultural activity to minimize soil erosion and minimize the release of contaminants into surface and groundwater resources. CE-L.2. Limit retail activity in agriculturally-designated areas to uses that are reasonably related to agriculture (e.g., sale of locally grown farm products). CE-L.3. Encourage agricultural operations such as community farms and gardens (especially on City-leased lands) to provide for educational experiences which demonstrate the history, importance and value of agricultural operations, and to provide more healthy, sustainable, local food options. CE-L.4. Continue water reclamation research programs to develop realistic methods of providing inexpensive means of leaching soils, irrigating crops and preventing salt water intrusion. CE-L.5. Integrate agriculture and sustainability principles that promote clean air and water, and healthy soils, habitats, and ecosystems. a. Encourage sustainable agricultural and water quality best management practices, such as tillage, use of grass filter strips, runoff detention basins, and organic farming, on all private land and require BMPs on new or renewed City land leased for agricultural purposes. Provide the minimum amount of flood control/channelization. b. Encourage sustainable agricultural operations, especially on City-leased lands, to offer more sustainable, local food choices. CE-L.6. Provide mechanisms to permit private land owners of prime agricultural lands to take advantage of the Williamson Act. CE-L.7. Balance the economic benefits provided by agricultural uses with the competing water resource, biological and cultural resource management and recreation priorities. See also Historic Preservation Element policies HP- A.2, A.3, and A.4 concerning historical and cultural resources, and government-to-government relationships with the Kumeyaay/Diegueno tribes of San Diego. See the Conservation Element Policy CE-B.1.e and Section G for policies pertaining to native plants and biological resources.

Jurisdiction	Regulation, Policy, or Program
	CE-L.8. Foster an urban agriculture system that is environmentally and economically sustainable. Encourage the use of urban agricultural techniques that require reduced land and water use as compared to conventional methods. • Recognize the cultural and economic benefits of providing opportunities for residents to grow healthy, affordable, culturally appropriate foods, and to augment their food budget through urban agriculture. • Reduce waste and increase agricultural productivity through increased composting of organic waste. • Recognize the essential role of honeybees and other pollinators in healthy ecosystems and in the food supply chain. Support safe and reasonable beekeeping. CE-L.9. Increase opportunities for urban agriculture. • Develop land development regulations that allow urban agriculture uses in appropriate locations, with parameters designed to control potential impacts on neighboring uses and properties. • Develop land development regulations that increase opportunities for farmers markets on public and private lands. • Monitor implementation of urban agriculture goals and policies. • Support rooftop gardens and the use of edible landscape materials. • Encourage the use of vacant land underutilized lots for urban agriculture. • Explore potential locations for urban agriculture uses as a part of long range plans and other projects.
San Marcos	No applicable agricultural regulations, policies, or programs.
Santee	The City of Santee allows agricultural use in lands designated as Open Space under special conditions (City of Santee 2003).
Solana Beach	No applicable agricultural regulations, policies, or programs (City of Solana Beach 1988).
Vista	The General Plan states that in Vista, where agricultural enterprises are small-scale, scattered, and surrounded by other land uses, it is appropriate to promote the retention of agricultural uses through land use designations that allow these uses, rather than designating the land as open space.
County of San Diego	County of San Diego Code of Regulatory Ordinances Sections 63.401 and 63.402, the Agricultural Enterprises and Notice to Prospective Homeowners Ordinance, defines and limits the circumstances under which agricultural enterprise activities, operations, and facilities will constitute a nuisance. The San Diego County Board of Supervisors Policy I-38, Support and Encouragement of Farming in San Diego County, sets forth policies for the implementation of the Williamson Act. The County of San Diego General Plan has the following policies: LU-5.3 Rural Land Preservation. Ensure the preservation of existing open space and rural areas (e.g., forested areas, agricultural lands, wildlife habitat and corridors, wetlands, watersheds, and groundwater recharge areas) when permitting development under the Rural and Semi Rural Land Use Designations. LU-6.4 Sustainable Subdivision Design. Require that residential subdivisions be planned to conserve open space and natural resources, protect agricultural operations including grazing, increase fire safety and defensibility, reduce impervious footprints, use sustainable development practices, and, when appropriate, provide public amenities. [See applicable community plan for possible relevant policies.]

Jurisdiction	Regulation, Policy, or Program
	LU-7.1: Agricultural Land Development. Protect agricultural lands with lower density land use designations that support continued agricultural operations. LU-7.2: Parcel Size Reduction as Incentive for Agriculture. Allow for reductions in lot size for compatible development when tracts of existing historically agricultural land are preserved in conservation easements for continued agricultural use. COS-6.1 Economic Diversity. Support the economic competitiveness of agriculture and encourage the diversification of potential sources of farm income, including value added products, agricultural tourism, roadside stands, organic farming, and farmers markets. COS-6.2 Protection of Agricultural Operations. Protect existing agricultural operations from encroachment of incompatible land uses by doing the following: • Limiting the ability of new development to take actions to limit existing agricultural uses by informing and educating new projects as to the potential impacts from agricultural operations. • Encouraging new or expanded agricultural land uses to provide a buffer of non-intensive agriculture or other appropriate uses (e.g., landscape screening) between intensive uses and adjacent nonagricultural land uses. • Allowing for agricultural uses in agricultural areas and designing development and lots in a manner that facilitates continued agricultural use within the development. • Requiring development to minimize potential conflicts with adjacent agricultural operations through the incorporation of adequate buffers, setbacks, and project design measures to protect surrounding agriculture. • Supporting local and State right-to-farm regulations. • Retain or facilitate large and contiguous agricultural operations by consolidation of development during the subdivision process. COS-6.3 Compatibility with Recreation and Open Space. Encourage siting recreational and open space uses and multi-use trails that are compatible with agriculture adjacent to the agricultural lands when planning for development adjacent to agricultural land uses. COS-6.4: Conservation Easements. Support the acquisition or voluntary dedication of agriculture conservation easements and programs that preserve agricultural lands. COS-6.5 Best Management Practices. Encourage best management practices in agriculture and animal operations to protect watersheds, reduce GHG emissions, conserve energy and water, and utilize alternative energy sources, including wind and solar power. <u>In addition, as noted under Chula Vista, the Otay Ranch General Development Plan, approved jointly by the City of Chula Vista and County of San Diego for the future development of Otay Ranch, establishes goals, objectives, policies, and implementation measures relative to the protection of agricultural resources. The Range Management Plan for Otay Ranch recommendations and implementing actions are provided for ongoing managed grazing activities on conveyed lands if the activity is shown not to negatively affect biological resources.</u>

Sources: City of Carlsbad 2015, 2019a, 2019b; City of Chula Vista 2019, 2020; City of Coronado 2003; City of Del Mar 1985; City of El Cajon 2001; City of Encinitas 1995, 2019; City of Escondido 2012; City of Imperial Beach 2019; City of La Mesa 2013; City of Lemon Grove 1996; City of National City 2011; City of Oceanside 2002; City of Poway 1991; City of San Diego 2015, 2020; City of San Marcos 2012; City of Santee 2003; City of Solana Beach 1988; City of Vista 2014; County of San Diego 2015.

Local jurisdictions' adopted general plans, regulations, and policies also address the preservation and use of open space and biological resources, including forest lands. These plans include the County of San Diego's Multiple Species Conservation Program (MSCP) and associated municipality MSCP subarea plans, Multiple Habitat Conservation Program (MHCP), *TransNet* Environmental Mitigation Program, and other local biological resources regulations as described in Section 4.4.

4.2.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts, in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the CEQA Guidelines Appendix G checklist questions. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR and the unique characteristics of the proposed Plan.

Checklist questions for agricultural and forestry resources are provided in Section II of CEQA Guidelines Appendix G. To streamline the analysis, the CEQA Guidelines Appendix G questions have been combined and modified as appropriate. Criterion II (a) is addressed in AG-1, which is expanded to include all farmland, not just farmland mapped by the FMMP. Criteria (b) and (c) related to Williamson Act lands and lands zoned for agriculture are addressed in AG-2. Criteria (c) and (d) related to forestry resources are addressed in FR-1. Because no timberlands or timberland production zones exist in the proposed Plan Area, this resource is not addressed in the impact analysis below. Criterion (e) addressing other factors that may result in the conversion of agricultural and forestry resources is addressed in criteria AG-1, AG-2 and FR-1.

Implementation of the proposed Plan would have a significant agricultural and forestry resources impact if it would:

AG-1	Convert agricultural lands to nonagricultural use.
AG-2	Conflict with existing zoning for agricultural use, or a Williamson Act contract.
FR-1	Convert or result in the loss of "Forest Land" as defined in the California Forest Legacy Act of 2007 (Public Resources Code Section 12220(g)).

4.2.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

AG-1 CONVERT AGRICULTURAL LANDS TO NONAGRICULTURAL USE

ANALYSIS METHODOLOGY

This section analyzes the impacts on agricultural lands if implementation of the proposed Plan would convert agricultural lands to nonagricultural use. A significant impact on agricultural lands would occur if any agricultural lands were converted to nonagricultural use as a result of the regional growth and land use change or transportation network improvements under the proposed Plan. Impacts associated with the conversion of agricultural land are quantified and conversion projections include agricultural parcels of all sizes. In addition to impacts from direct conversion of land, the analysis also considers indirect effects on the viability of continued agricultural production in areas where regional growth and land use change or transportation network improvements would result in indirect impacts on these resources. Projects in proximity to agricultural lands could cause land use conflicts that indirectly result in additional agricultural land conversions. These conflicts include noise, odors, water rights and use, chemicals, and runoff. Urban

development near agricultural land increases the value of the agricultural land, which makes land purchase for agricultural expansion difficult, and provides more incentive to sell the property for nonagricultural use. Commercial, office, or industrial uses would also be incompatible when abutting lands with agricultural operations.

Any nonagricultural growth and land use change within existing agricultural lands is considered a direct impact on these resources. The direct impacts of regional growth and land use change are quantified using geographical information system (GIS) methods by overlaying forecasted regional growth and land use change onto the existing agricultural lands dataset described in Section 4.2.1, *Existing Conditions*. The analysis quantifies direct impacts on acres of existing agricultural lands using different approaches: (1) growth in land use categories other than Spaced Rural Residential and (2) growth in Spaced Rural Residential. Regional growth and land use changes resulting in Agricultural, Open Space Park. and Vacant land are assumed not to convert agricultural lands to non-agricultural use.

For growth and land use change (other than growth in the Spaced Rural Residential category), an impact on any part of an existing agricultural parcel is considered a 100 percent conversion of that parcel to a nonagricultural use. Impacts were calculated separately for each subcategory of agricultural land (e.g., orchards and vineyards, field crops). The analysis of growth in the Spaced Rural Residential land use category is based on a conversion factor that assumes subdivision of agricultural lands results in permanent conversion of 1.5 acres of agricultural lands to nonagricultural use per lot. This value was determined based on a review of past built-out subdivision projects on existing agricultural lands in unincorporated San Diego County, which calculated that, on average, subdivision of existing agricultural lands resulted in permanent conversion of 1.5 acres of agricultural lands to nonagricultural use per lot.

Transportation network improvements that would convert existing agricultural lands to nonagricultural use are considered 100 percent conversion, and are calculated for each project that would have a direct impact on existing agricultural lands. The direct impacts of transportation network improvements are evaluated through GIS methods by overlaying transportation improvement project footprints onto the existing agricultural lands dataset.

Agricultural land impacts were evaluated through GIS by overlaying transportation improvement project footprints onto the baseline dataset described in Section 4.2.1. Transportation improvement project impacts were calculated for each project that requires new construction in undeveloped areas. Transportation improvement project footprints are based on what is known about planned transportation network improvements contained in the proposed Plan at the time of analysis (see Appendix B).

The transportation network footprints are estimated though a coordinated effort by SANDAG transportation modeling, GIS, engineering, and planning staff. Buffer size assumptions are specific to each travel mode and rely on engineering plan estimates from similar project improvements to calculate footprint width using model input geographies. The assumptions for each travel mode were presented at a peer review and SANDAG staff are in agreement regarding the overall process and assumptions used.

Highway transportation and regional arterial improvement project footprints are defined by buffering line segment project geographies from the SANDAG highway model network. These layers are an early approximation of the dimensions of the planned improvements, which factor in lane width and buffer/movable barrier size assumptions from engineering drawings of similar projects, and the proposed number of lanes and auxiliary lanes from the SANDAG transportation model network. For highways, it was assumed that each travel lane is 12 feet wide, multiplied by the total number of proposed lanes. Shoulder widths added an additional 24

feet, accounting for a 12-foot outer shoulder and 12-foot inner shoulder in the highway footprint. Managed Lanes buffers are assumed to be 8 feet, or 4 feet in each direction. Where a movable barrier is assumed, another 4-foot buffer is applied. In addition, where there are ramps or connectors, it is assumed that each lane on the ramp or connector is 12 feet wide with an added 8 feet to account for inner and outer ramp shoulders. . For regional arterials, each lane is assumed to be 12 feet wide and a 4-foot buffer in each direction is assumed to account for sidewalks.

Rail transit improvement project footprints, specifically Trolley, LOSSAN, and SPRINTER lines only in areas where there are new extensions or alignment changes, are defined by a rail width buffer of 50 feet. Bus transit improvement footprints are not developed because routes would use existing or planned road or highway or managed lane segments. New bikeway footprints (i.e., active transportation elements) are estimated assuming bikeways are 14 feet wide. Bikeway footprints are not developed in situations where they would occur within existing or planned road or highway segments.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Regional growth and land use change between 2016 and 2025 would convert agricultural lands to nonagricultural use as shown in Figure 4.2-4, which would decrease the viability of agriculture on those lands. Table 4.2-3 shows that regional growth and land use categories other than Spaced Rural Residential would convert approximately 5,910 acres to nonagricultural use, including 558 acres of FMMP-designated agricultural land under CEQA (16 acres of Prime Farmland, 4 acres of Farmland of Statewide Importance, and 538 acres of Unique Farmland). Additionally, regional growth in the Spaced Rural Residential land use category would convert an estimated 491 acres to nonagricultural use, including about 152 acres of FMMP-designated agricultural land under CEQA. Impacts are primarily distributed throughout the northern half of the County, with the exception of concentrated impact areas in the vicinity of the Chula Vista and San Ysidro mobility hubs in the southern part of the County.

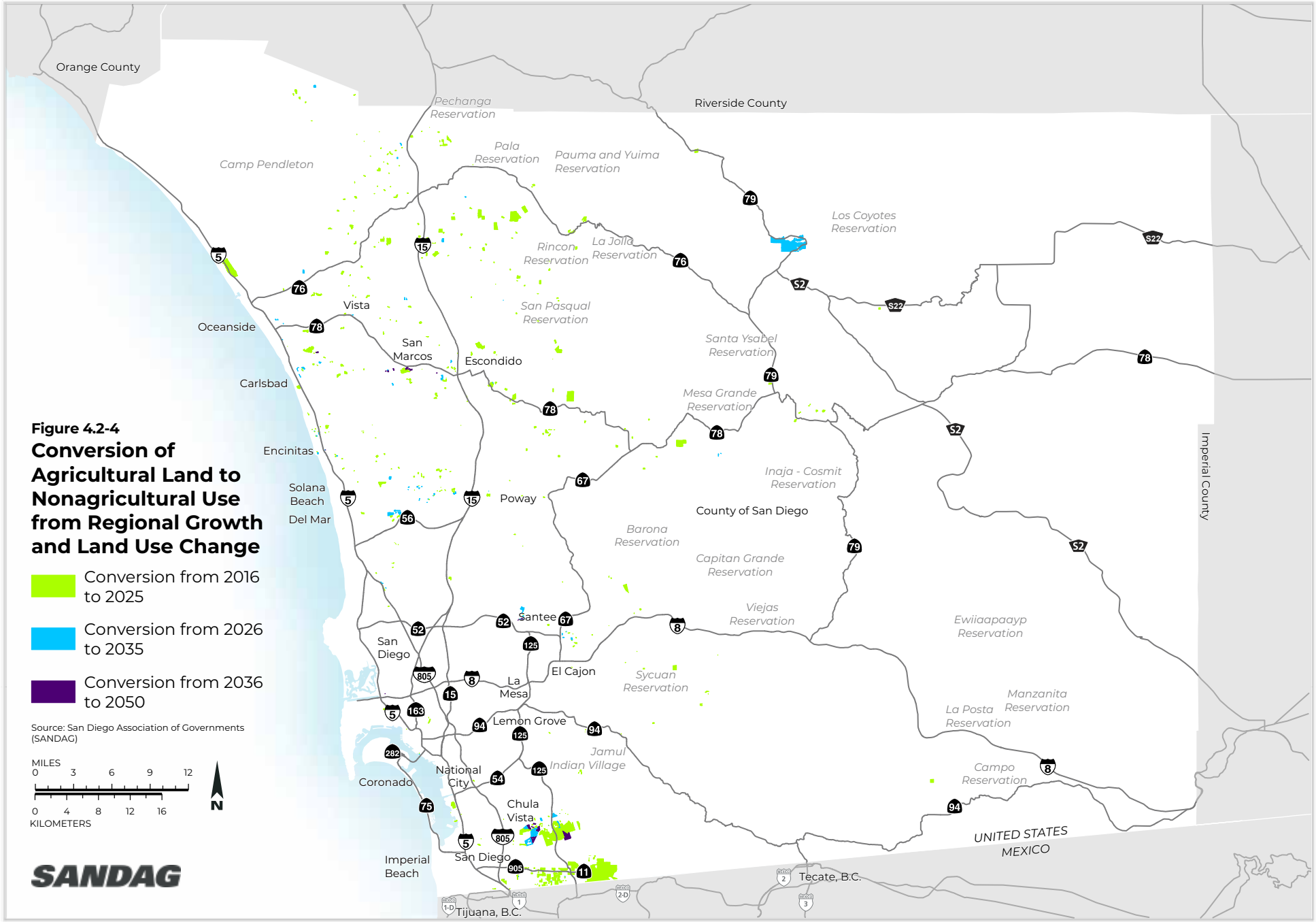
Approximately 6,401 acres of existing agricultural land (all parcel sizes) would be converted to nonagricultural uses between 2016 and 2025, including roughly 709 acres of FMMP-designated agricultural land.

Regional growth that occurs in proximity to agricultural lands would also cause land use conflicts that would indirectly result in additional agricultural land conversions. These conflicts include noise, odors, water rights and use, chemicals, and runoff. Urban development near agricultural land increases the value of the agricultural land, which makes land purchase for agricultural expansion difficult, and provides more incentive to sell the property for nonagricultural use. Commercial, office, or industrial uses would also be incompatible when abutting lands with agricultural operations.

Existing laws and programs described in Section 4.2.2, such as the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 and policies of local jurisdictions, would protect some agricultural lands and reduce the pressure to convert agricultural lands to nonagricultural use. However, the proposed Plan's regional growth and land use changes would still convert agricultural lands to nonagricultural use, and this impact would be significant.

Table 4.2-3
Conversion of Agricultural Lands to Nonagricultural Use from Regional Growth and Land Use Change, 2016–2025

Agricultural Category	Agricultural Lands (acres)		Conversion to Nonagricultural Use (acres)		
	2016	2025	100 Percent	Spaced Rural Residential	Total
Prime Farmland	5,320	5,298	16	6	22
Farmland of Statewide Importance	7,431	7,417	4	11	14
Unique Farmland	40,986	40,315	538	135	673
FMMP-designated Agricultural Land Under CEQA	**53,738**	**53,029**	**558**	**152**	**709**
Farmland of Local Importance	157,682	154,359	3,166	157	3,323
Grazing Lands	281,461	280,176	1,223	62	1,286
Local Agricultural Land Outside of FMMP	73,334	72,250	963	120	1,083
Other Farmland	**512,476**	**506,785**	**5,352**	**339**	**5,692**
Total	**566,215**	**559,813**	**5,910**	**491**	**6,401**

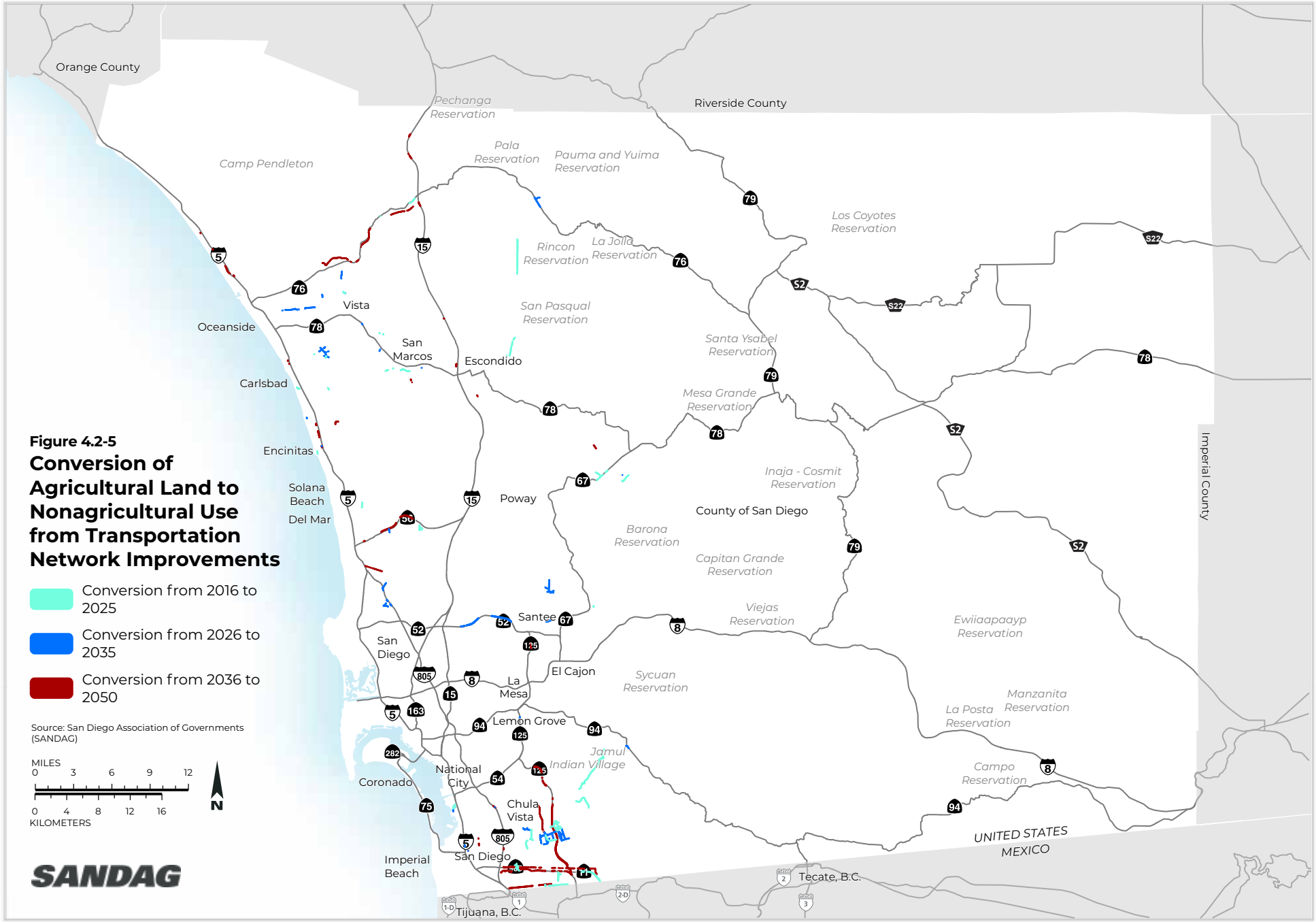

Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Inaja - Cosmit Reservation
County of San Diego
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Santee
San Diego
El Cajon
La Mesa
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Lemon Grove
Jamul Indian Village
Campo Reservation
National City
Coronado
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.
Figure 4.2-4
Conversion of Agricultural Land to Nonagricultural Use from Regional Growth and Land Use Change
Conversion from 2016 to 2025
Conversion from 2026 to 2035
Conversion from 2036 to 2050
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Transportation Network Improvements and Programs

As shown in Table 4.2-4, approximately 57 acres of existing agricultural land would be converted to nonagricultural use as a result of the transportation network improvements and programs planned between 2016 and 2025. This impact does not affect FMMP-designated agricultural land under CEQA. Impacts through 2025 are the result of a number of local roadway improvements throughout the County, as well as the SR 125 Connector from Bonita Road to the U.S.-Mexico border, and Complete Corridor Managed Lanes along SR 11. The proposed Plan's transportation network improvements and programs would convert agricultural lands to non-agricultural use, and this impact would be significant.

Table 4.2-4
Conversion of Agricultural Lands to Nonagricultural Use from Planned Transportation Network Improvements and Programs, 2016–2025

Agricultural Category	Agricultural Lands (acres)		Total Conversion to Nonagricultural Use (acres)
	2016	2025	
Prime Farmland	5,320	5,320	0
Farmland of Statewide Importance	7,431	7,431	0
Unique Farmland	40,986	40,986	0
FMMP-designated Agricultural Land Under CEQA	**53,738**	**53,738**	**0**
Farmland of Local Importance	157,682	157,647	35
Grazing Lands	281,461	281,447	14
Local Agricultural Land Outside of FMMP	73,334	73,325	9
Other Farmland	**512,476**	**512,419**	**57**
Total	**566,215**	**566,157**	**57**


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.
Figure 4.2-5
Conversion of Agricultural Land to Nonagricultural Use from Transportation Network Improvements
Conversion from 2016 to 2025
Conversion from 2026 to 2035
Conversion from 2036 to 2050
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

2025 Conclusion

Implementation of forecasted regional growth and land use change and planned transportation network improvements would convert approximately 6,458 acres of agricultural lands to nonagricultural use, including about 709 acres of FMMP-designated agricultural lands under CEQA. In addition, growth and land use change near agricultural lands would indirectly decrease the viability of agriculture production on those lands. Therefore, this impact (AG-1) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

Regional growth and land use change between 2026 and 2035 would convert additional agricultural lands to nonagricultural use as shown in Figure 4.2-4. Table 4.2-5 shows that regional growth and land use categories other than Spaced Rural Residential would convert approximately 676 acres to nonagricultural use, including 49 acres of FMMP-designated agricultural land under CEQA (8 acres of Prime Farmland, 20 acres of Farmland of Statewide Importance, and 21 acres of Unique Farmland). Additionally, regional growth in the Spaced Rural Residential land use category would convert an estimated 48 acres to nonagricultural use, including about 2 acres of FMMP-designated agricultural land. Impacts between 2026 and 2035 are distributed in the northern half of the County with concentrations along SR 79 (north of SR 52), and in the vicinity of the Chula Vista Mobility Hub.

Approximately 724 acres of existing agricultural land (all parcel sizes) would be converted to nonagricultural uses between 2026 and 2035, including 51 acres of FMMP-designated agricultural lands. Between 2016 and 2035, about 7,125 total acres of existing agricultural land would cumulatively be converted to nonagricultural use, including 811 acres of FMMP-designated agricultural land.

As described above, regional growth in proximity to agricultural lands would also cause land use conflicts that would indirectly result in additional agricultural land conversions. Existing laws and programs would protect some agricultural lands and reduce the pressure to convert agricultural lands to nonagricultural use. However, the proposed Plan's regional growth and land use changes would still convert agricultural lands to nonagricultural use, and this impact would be significant.

Table 4.2-5
Conversion of Agricultural Lands to Nonagricultural Use from Regional Growth and Land Use Change, 2026–2035

	Agricultural Lands (acres)		Conversion to Nonagricultural Use (acres)			Cumulative Total 2016–2035		
Agricultural Category	2026	2035	100 Percent	Spaced Rural Residential	Total	100 Percent	Spaced Rural Residential	Total
Prime Farmland	5,298	5,290	8	0	8	25	6	31
Farmland of Statewide Importance	7,417	7,397	20	0	20	24	11	34
Unique Farmland	40,315	40,291	21	2	23	559	137	695
FMMP-designated Agricultural Land Under CEQA	**53,030**	**52,978**	**49**	**2**	**51**	**607**	**153**	**760**
Farmland of Local Importance	154,359	153,992	352	15	367	3,518	172	3,690
Grazing Lands	280,176	280,064	89	23	112	1,312	85	1,397
Local Agricultural Land Outside of FMMP	72,250	72,056	185	9	194	1,149	129	1,277
Other Farmland	**506,785**	**506,112**	**626**	**46**	**673**	**5,979**	**386**	**6,364**
Total	**559,813**	**559,090**	**676**	**48**	**724**	**6,586**	**539**	**7,125**

Transportation Network Improvements and Programs

As shown in Table 4.2-6, approximately 80 acres of existing agricultural land would be converted to nonagricultural use as a result of the transportation network improvements and programs planned between 2026 and 2035, including 7 acres of FMMP-designated agricultural land under CEQA (1 acre of Prime Farmland, and 6 acres of Unique Farmland). Impacts between 2026 and 2035 are the result of a number of local roadway improvements, as well as a number of active transportation trails, and Complete Corridors improvements along I-5, I-805, SR 52, SR 76, SR 78, SR 94 and SR 125. Between 2016 and 2035, about 138 total acres of existing agricultural land would cumulatively be converted to nonagricultural use, including 7 acres of FMMP-designated agricultural land. The proposed Plan's transportation network improvements and programs would convert agricultural lands to nonagricultural use, and this impact would be significant.

Table 4.2-6
Conversion of Agricultural Lands to Nonagricultural Use from Planned Transportation Network Improvements and Programs, 2026–2035

Agricultural Category	Agricultural Lands (acres)		Total Conversion to Nonagricultural Use (acres)	Cumulative Total 2016–2035
	2026	2035		
Prime Farmland	5,320	5,320	1	1
Farmland of Statewide Importance	7,431	7,431	0	0
Unique Farmland	40,986	40,980	6	6
FMMP-designated Agricultural Land Under CEQA	**53,738**	**53,731**	**7**	**7**
Farmland of Local Importance	157,647	157,636	11	45
Grazing Lands	281,447	281,393	54	68
Local Agricultural Land Outside of FMMP	73,325	73,316	9	17
Other Farmland	**512,419**	**512,346**	**74**	**131**
Total	**566,157**	**566,077**	**80**	**138**

2035 Conclusion

Implementation of forecasted regional growth and land use change and planned transportation network improvements from 2026 to 2035 would convert approximately 804 acres of agricultural lands to nonagricultural use, including 57 acres of FMMP-designated agricultural lands. Between 2016 and 2035, about 7,263 total acres of existing agricultural land would cumulatively be converted to nonagricultural use, including 767 acres of FMMP-designated agricultural land under CEQA. Growth and land use change near agricultural lands would also indirectly decrease the viability of agriculture production on those lands. Therefore, this impact (AG-1) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

Regional growth and land use change between 2036 and 2050 would convert additional agricultural lands to nonagricultural use, as shown in Figure 4.2-4. Table 4.2-7 shows that regional growth and land use categories other than Spaced Rural Residential would convert approximately 461 acres to nonagricultural use, though no FMMP-designated agricultural land under CEQA would be affected. Regional growth in the Spaced Rural Residential land use category would not convert additional agricultural land. Impacts between 2036 and 2050 are distributed in the northern half of the County.

Approximately 461 acres of existing agricultural land (all parcel sizes) would be converted to nonagricultural uses between 2036 and 2050, with no FMMP-designated agricultural lands under CEQA being affected. Between 2016 and 2050, about 7,5860 total acres of existing agricultural land would cumulatively be converted to nonagricultural use, including 760 acres of FMMP-designated agricultural land.

As described above, regional growth in proximity to agricultural lands would also cause land use conflicts that would indirectly result in additional agricultural land conversions. Existing laws and programs would protect some agricultural lands and reduce the pressure to convert agricultural lands to nonagricultural use. However, the proposed Plan's regional growth and land use changes would still convert agricultural lands to nonagricultural use, and this impact would be significant.

Table 4.2-7
Conversion of Agricultural Lands to Nonagricultural Use from Regional Growth and Land Use Change, 2036–2050

	Agricultural Lands (acres)		Conversion to Nonagricultural Use (acres)			Cumulative Total 2016–2050		
Agricultural Category	2036	2050	100 Percent	Spaced Rural Residential	Total	100 Percent	Spaced Rural Residential	Total
Prime Farmland	5,290	5,290	0	0	0	25	6	31
Farmland of Statewide Importance	7,397	7,397	0	0	0	24	1	34
Unique Farmland	40,291	40,291	0	0	0	559	137	695
FMMP-designated Agricultural Land Under CEQA	**52,978**	**52,978**	**0**	**0**	**0**	**607**	**153**	**760**
Farmland of Local Importance	153,992	153,771	220	0	220	3,738	172	3,910
Grazing Lands	280,064	279,874	190	0	190	1,502	85	1,587
Local Agricultural Land Outside of FMMP	72,056	72,005	51	0	51	1,200	129	1,329
Other Farmland	**506,112**	**505,651**	**461**	**0**	**461**	**6,440**	**386**	**6,826**
Total	**559,090**	**558,629**	**461**	**0**	**461**	**7,047**	**539**	**7,586**

Transportation Network Improvements and Programs

As shown in Table 4.2-8, approximately 463~~2~~ acres of existing agricultural land would be converted to nonagricultural use as a result of the transportation network improvements and programs planned between 2036 and 2050, including 2 acres of FMMP-designated agricultural land under CEQA (1 acre of Farmland of Statewide Importance, and 1 acre of Unique Farmland). Impacts between 2036 and 2050 would primarily be caused by active transportation projects (including in the Encinitas to San Marcos corridor, the I-805 connector, the San Luis Rey River Trail, the SR 125 connector, and in the SR 905 corridor), Complete Corridor Managed Lanes projects (including along SR 125, SR 56, I-15, I-5, I-805 and SR 905), and commuter rail projects included in the Transit Leap (including Commuter Rail 582 and 583 and LRT 399 and 310). Between 2016 and 2050, about 601~~0~~ total acres of existing agricultural land would be cumulatively converted to nonagricultural use, including 9 acres of FMMP-designated agricultural land under CEQA. The proposed Plan's transportation network improvements would convert agricultural lands to non-agricultural use, and this impact would be significant.

Table 4.2-8
Conversion of Agricultural Lands to Nonagricultural Use from Planned Transportation Network Improvements, 2036–2050

Agricultural Category	Agricultural Lands (acres)		Total Conversion to Nonagricultural Use (acres)	Cumulative Total 2016–2050
	2036	2050		
Prime Farmland	5,320	5,320	0	1
Farmland of Statewide Importance	7,431	7,431	1	2
Unique Farmland	40,980	40,978	1	6
FMMP-designated Agricultural Land Under CEQA	**53,731**	**53,728**	**2**	**9**
Farmland of Local Importance	157,636	157,416	220	265
Grazing Lands	281,393	281,204	189	257
Local Agricultural Land Outside of FMMP	73,316	73,264~~5~~	52~~1~~	69~~8~~
Other Farmland	**512,346**	**511,885~~6~~**	**461~~0~~**	**592~~1~~**
Total	**566,077**	**565,614~~5~~**	**463~~2~~**	**601~~0~~**

2050 Conclusion

Implementation of planned transportation network improvements from 2036 to 2050 would convert approximately 92~~43~~ acres of agricultural lands to nonagricultural use, including approximately 2 acres of FMMP-designated agricultural land under CEQA. Between 2016 and 2050, about 8,187~~6~~ total acres of existing agricultural land would be cumulatively converted to nonagricultural use, including 769 acres of FMMP-designated agricultural land under CEQA. In addition, growth and land use change near agricultural lands would indirectly decrease the viability of agriculture production on those lands. Therefore, this impact (AG-1) in the year 2050 is significant.

Exacerbation of Climate Change Effects

Climate change impacts such as reduced precipitation, increased drought and evapotranspiration, and changes in snowpack melt timing could reduce imported and surface water sources and increase reliance on groundwater, resulting in depletion of groundwater supplies and reducing agricultural water supplies. Changed pest regimes and destructive events like wildfire could also adversely affect agricultural land. This depletion could remove irrigation supplies for land dependent on groundwater, making that land unsuitable for agriculture in the future. The proposed Plan could exacerbate this by converting even more agricultural land to non-agricultural use, further decreasing the amount of land suitable for agriculture.

MITIGATION MEASURES

AG-1 CONVERT AGRICULTURAL LANDS TO NONAGRICULTURAL USE.

2025, 2035, and 2050

AG-1a Preserve Existing Agricultural Lands. During project design and project-level CEQA review of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, preserve existing agricultural lands by avoiding agricultural land conversion when feasible; if not feasible, measures to reduce conversion of agricultural lands to nonagricultural use include, but are not limited to, the following:

- Acquire or dedicate agricultural conservation easements (minimum acreage ratio of 1:1 of comparable quality land). If feasible, locate the easement within or close to the same city or community in which the conversion occurs. Where conversion occurs within the Coastal Zone, locate the easement within the Coastal Zone, if feasible.
- If a project requires cancellation of a Williamson Act contract, acquire or dedicate agricultural conservation easements (minimum acreage ratio of 1:1 of comparable quality land). If feasible, locate the easement within or close to the same city or community in which the cancellation occurs. Where the cancellation occurs within the Coastal Zone, locate the easement within the Coastal Zone, if feasible.
- Where agricultural conservation easements are acquired or dedicated, consider the suitability of a specific proposed easement on its ability to avoid or reduce fragmentation of agricultural land to enhance overall production value and operation viability.
- Where project-specific mitigation described above is not feasible, use other commensurate solutions, such as payment of an agricultural resource impact fee made pursuant to an approved in-lieu fee program.

AG-1b Reduce Transportation Network Improvement and Development Conflicts with Agricultural Operations. During project design and project-level CEQA review of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, reduce conflicts with agricultural operations through the implementation of project design features and mitigation measures to protect surrounding agriculture, including, but not limited to, the following:

- Provide buffers, berms, setbacks, fencing, or other project design measures to protect surrounding agriculture, topographic features, and open space, and to reduce conflict between transportation network improvements and/or developments and farming.

- Minimize severance and fragmentation of agricultural land by constructing underpasses and overpasses at reasonable intervals to provide property access.
- Align corridors, incorporate buffer zones and setbacks, and design berms and fencing to avoid agricultural lands and to reduce conflicts between transportation projects and agricultural lands.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of the proposed Plan would result in significant impacts on agricultural lands in 2025, 2035, and 2050. While mitigation measures AG-1a and AG-1b would reduce direct and indirect impacts associated with the conversion of agricultural lands to nonagricultural use, there is no assurance that the impacts of all development and transportation network improvement projects and programs included in the proposed Plan would be reduced to less-than-significant levels. There is also case law indicating that conservation easements alone are not adequate CEQA mitigation to reduce agricultural land conversion impacts to less than significant levels; see King & Gardiner Farms v County of Kern (2020) 45 CA5th 814. Therefore, agricultural land conversion impacts would remain significant and unavoidable.

AG-2 CONFLICT WITH EXISTING ZONING FOR AGRICULTURAL USE OR A WILLIAMSON ACT CONTRACT

ANALYSIS METHODOLOGY

This section analyzes conflicts with lands zoned for agricultural use and lands under Williamson Act contracts. A significant impact would occur under AG-2 if any existing lands zoned for agricultural use or with a Williamson Act contract would be designated for a nonagricultural land use as a result of the regional growth and land use change or transportation network improvements under the proposed Plan. The method for identifying conflicts is the same as described for physical conversion under AG-1, except that for AG-2, 100 percent of the existing land zoned for agricultural use or under Williamson Act contract that would be redesignated as Spaced Rural Residential is identified as a conflict and a direct impact. Indirect impacts are analyzed qualitatively, and occur when growth near agricultural zoned uses would cause land use conflicts. For determining conflicts with Williamson Act contract lands, the analysis assumes that the existing boundaries of these contracts would remain constant during the life of the proposed Plan.

During the timeframe of the proposed Plan, climate change effects that are likely to result in agricultural zoning and Williamson Act contract land impacts are the same as those described for AG-1.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

As shown in Table 4.2-9, regional growth and land use change between 2016 and 2025 would conflict with an estimated 1,162 acres of land zoned for agricultural use and about 732 acres of Williamson Act contract lands. The majority of these impacts are distributed in the northern and eastern portions of the County. See Figure 4.2-6 for locations of these conflicts.

Table 4.2-9
Conflicts with Existing Zoning for Agricultural Use or Williamson Act Contracts from Regional Growth and Land Use Change, All Years

	Acres of Conflict with Lands Zoned for Agriculture or Williamson Act Contracts				
	Conversion by Phase Years			Cumulative Impacts	
Agricultural Category	2016–2025	2026–2035	2036–2050	2016–2035	2016–2050
Land Zoned for Agricultural Use	1,162	171	0	1,333	1,333
Williamson Act Land	732	120	0	852	852

Regional growth that occurs in proximity to agricultural-zoned lands (as well as lands under Williamson Act contracts) would also cause land use conflict. These conflicts include, but are not limited to, noise, odors, water rights and use, chemicals, and runoff. Additionally, urban development near agricultural land increases the value of the agricultural land, which makes land purchase for agricultural expansion difficult, and provides more incentive to sell the property for nonagricultural use. Commercial, office, or industrial uses would also be incompatible uses when abutting lands with agricultural operations.

State and local policies and regulations described in Section 4.2.2, such as the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000, the Williamson Act, and policies outlined in the general plans of local jurisdictions, may reduce conflicts between regional growth and land use change, and lands zoned for agricultural use or under Williamson Act contract. However, these policies and regulations would be of limited effectiveness in substantially reducing these conflicts. Therefore, this is a significant impact.

Transportation Network Improvements and Programs

As shown in Table 4.2-10, the planned transportation network improvements and programs between 2016 and 2025 would conflict with an estimated 5 acres of existing lands zoned for agricultural use. No conflicts with Williamson Act contract lands would occur. These impacts are associated with a local roadway improvement in Ramona and one in Escondido. See Figure 4.2-6 for locations of these conflicts. The impact is significant.

Table 4.2-10
Conflicts with Existing Zoning for Agricultural Use or Williamson Act Contracts from Planned Transportation Network Improvements, All Years

	Acres of Conflict with Lands Zoned for Agriculture or Williamson Act Contracts				
	Conversion by Phase Years			Cumulative Impacts	
Agricultural Category	2016–2025	2026–2035	2036–2050	2016–2035	2016–2050
Land Zoned for Agricultural Use	5	4	18	9	27
Williamson Act Land	0	0	1	0	1

2025 Conclusion

Between 2016 and 2025, the proposed Plan's regional growth and land use changes and transportation network improvements and programs would conflict with approximately 1,167 acres of lands zoned for agricultural use and 732 acres of lands with Williamson Act contracts. Therefore, this impact (AG-2) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

As shown in Table 4.2-9, regional growth land use change between 2026 and 2035 would conflict with an estimated 171 acres of land zoned for agricultural use and 120 acres of Williamson Act contract lands. These impacts are scattered around the northern part of the County, with one concentrated area along SR 79 north of SR 52. See Figure 4.2-6 for locations of these conflicts. Between 2016 and 2035, the proposed Plan's regional growth and land use changes would cumulatively conflict with about 1,333 total acres of land zoned for agricultural use and 852 acres of Williamson Act contract lands.

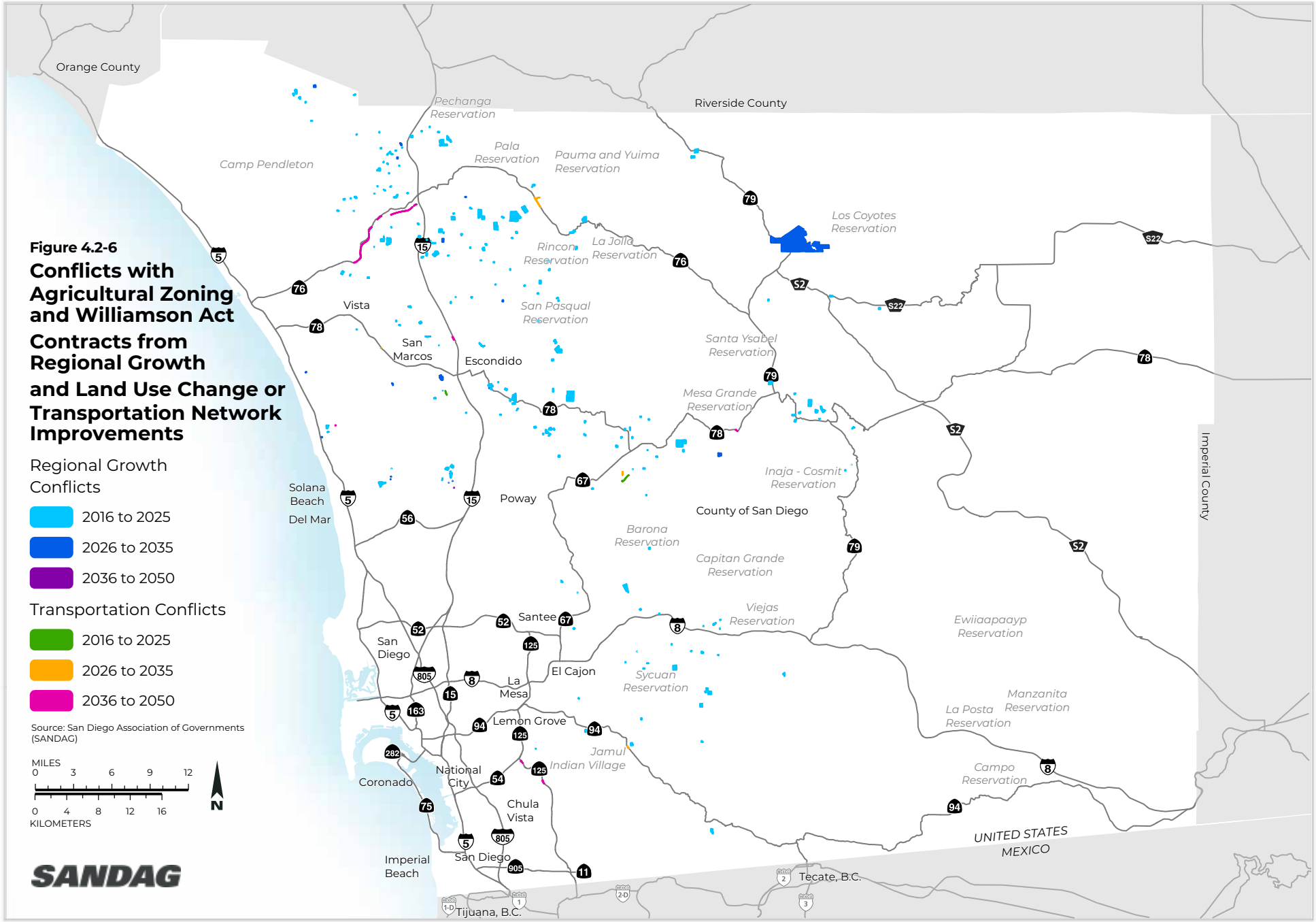


Figure 4.2-6
Conflicts with Agricultural Zoning and Williamson Act Contracts from Regional Growth and Land Use Change or Transportation Network Improvements
Regional Growth Conflicts
2016 to 2025
2026 to 2035
2036 to 2050
Transportation Conflicts
2016 to 2025
2026 to 2035
2036 to 2050
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Los Coyotes Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Sycuan Reservation
Ewiiaapaayp Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Vista
San Marcos
Escondido
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO

As described above, regional growth in proximity to agricultural lands (as well as lands under Williamson Act contracts) would also cause land use conflicts that would make land purchase for agricultural expansion difficult and provides more incentive to sell the property for nonagricultural use. State and local policies and regulations may reduce conflicts between regional growth and land use change, and lands zoned for agricultural use or under Williamson Act contract. However, these policies and regulations would be of limited effectiveness in substantially reducing these conflicts. Therefore, this is a significant impact.

Transportation Network Improvements and Programs

As shown in Table 4.2-10, the planned transportation network improvements and programs between 2026 and 2035 would conflict with an estimated 4 acres of existing lands zoned for agricultural use. These impacts are associated with minor transportation improvements along SR 76 and SR 94. See Figure 4.2-6 for locations of these conflicts. No conflicts with Williamson Act contract lands would occur during this period. Between 2016 and 2035, about 9 total acres of land zoned for agricultural use would be cumulatively converted to nonagricultural use. This impact is significant.

2035 Conclusion

Between 2026 and 2035, the proposed Plan's regional growth and land use changes and transportation network improvements and programs would conflict with approximately 175 acres of lands zoned for agricultural use and 120 acres of lands with Williamson Act contracts. Between 2016 and 2035 the proposed plan would cumulatively conflict with about 1,333 total acres of land zoned for agricultural use and 852 total acres of lands with Williamson Act contracts. This impact (AG-2) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

As shown in Table 4.2-9, regional growth and land use change between 2036 and 2050 would not conflict with Williamson Act contract lands or land zoned for agricultural use. Between 2016 and 2050, the proposed Plan's regional growth and land use changes would cumulatively conflict with about 1,333 total acres of land zoned for agricultural use and 852 acres of Williamson Act contract lands.

As described above, regional growth in proximity to agricultural lands (as well as lands under Williamson Act contracts) would also cause land use conflicts that would make land purchase for agricultural expansion difficult and provides more incentive to sell the property for nonagricultural use. State and local policies and regulations may reduce conflicts between regional growth and land use change, and lands zoned for agricultural use or under Williamson Act contract. However, these policies and regulations would be of limited effectiveness in substantially reducing these conflicts. Therefore, this is a significant impact.

Transportation Network Improvements and Programs

As shown in Table 4.2-10, the planned transportation network improvements and programs between 2036 and 2050 would conflict with an estimated 18 acres of existing lands zoned for agricultural use, and 1 acre of lands with Williamson Act contracts. Additional impacts in this period are associated with transportation improvements along SR 76. See Figure 4.2-6 for locations of these conflicts. Between 2016 and 2050, the proposed Plan's transportation network improvements would cumulatively conflict with about 27 total acres of land zoned for agricultural use and 1 acre of lands with Williamson Act contracts. This impact is significant.

2050 Conclusion

Between 2036 and 2050, implementation of the proposed Plan's regional growth and land use changes and transportation network improvements and programs would conflict with approximately 18 acres of lands zoned for agricultural use and 1 acre of lands with Williamson Act contracts. Between 2016 and 2050 the proposed plan would cumulatively conflict with about 1,360 total acres of land zoned for agricultural use and 853 total acres of lands with Williamson Act contracts. This impact (AG-2) by the year 2050 is significant.

Exacerbation of Climate Change Effects

Climate change impacts such as reduced precipitation, increased drought, and evapotranspiration, and changes in snowpack melt timing could reduce imported and surface water sources and increase reliance on groundwater, resulting in depletion of groundwater supplies and reducing agricultural water supplies. Changed pest regimes, and destructive events like wildfire, could also adversely affect agricultural land or a Williamson Act Contract. This depletion could remove irrigation supplies for land dependent on groundwater, making that land unsuitable for agriculture in the future. The proposed Plan could exacerbate this by converting even more agricultural land to non-agricultural use, further conflicting with existing zoning for agricultural use or Williamson Act contracts.

MITIGATION MEASURES

AG-2 CONFLICT WITH EXISTING ZONING FOR AGRICULTURAL USE OR A WILLIAMSON ACT CONTRACT

2025, 2035, and 2050

Implement mitigation measures **AG-1a** and **AG-1b**, as described above.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of the proposed Plan would result in significant impacts by causing conflicts with lands with existing zoning or agricultural use, or under Williamson Act contract to agricultural lands in 2025, 2035, and 2050. While implementation of mitigation measures AG-1a and AG-1b would reduce these impact AG-2, there is no assurance that the impacts of all development and transportation network improvement projects implementing the proposed Plan would be reduced to less than significant levels. Therefore, conflicts with lands with existing zoning for agricultural use and under Williamson Act contract would remain significant and unavoidable.

FR-1 CONVERT OR RESULT IN THE LOSS OF "FOREST LAND" AS DEFINED IN THE CALIFORNIA FOREST LEGACY ACT OF 2007 (PUBLIC RESOURCES CODE SECTION 12220(G))

ANALYSIS METHODOLOGY

A significant impact on forest land would occur where existing forest lands are designated as a developed land use as a result of the regional growth and land use changes or developed with a transportation network improvement under the proposed Plan. Forest land includes riparian forest/woodland and upland

forest/woodland. Direct impacts are those resulting in damage to or death of vegetation from the direct actions of regional growth and land use changes or transportation network improvements. The methods for estimating conversion or loss of forest land are the same as described for AG-2: 100 percent of existing forest land that would be designated for development, including Spaced Rural Residential, or developed with a transportation network improvement is considered a loss of forest land. Indirect impacts are analyzed qualitatively, and occur when growth near forest land would cause land use conflicts.

IMPACT ANALYSIS

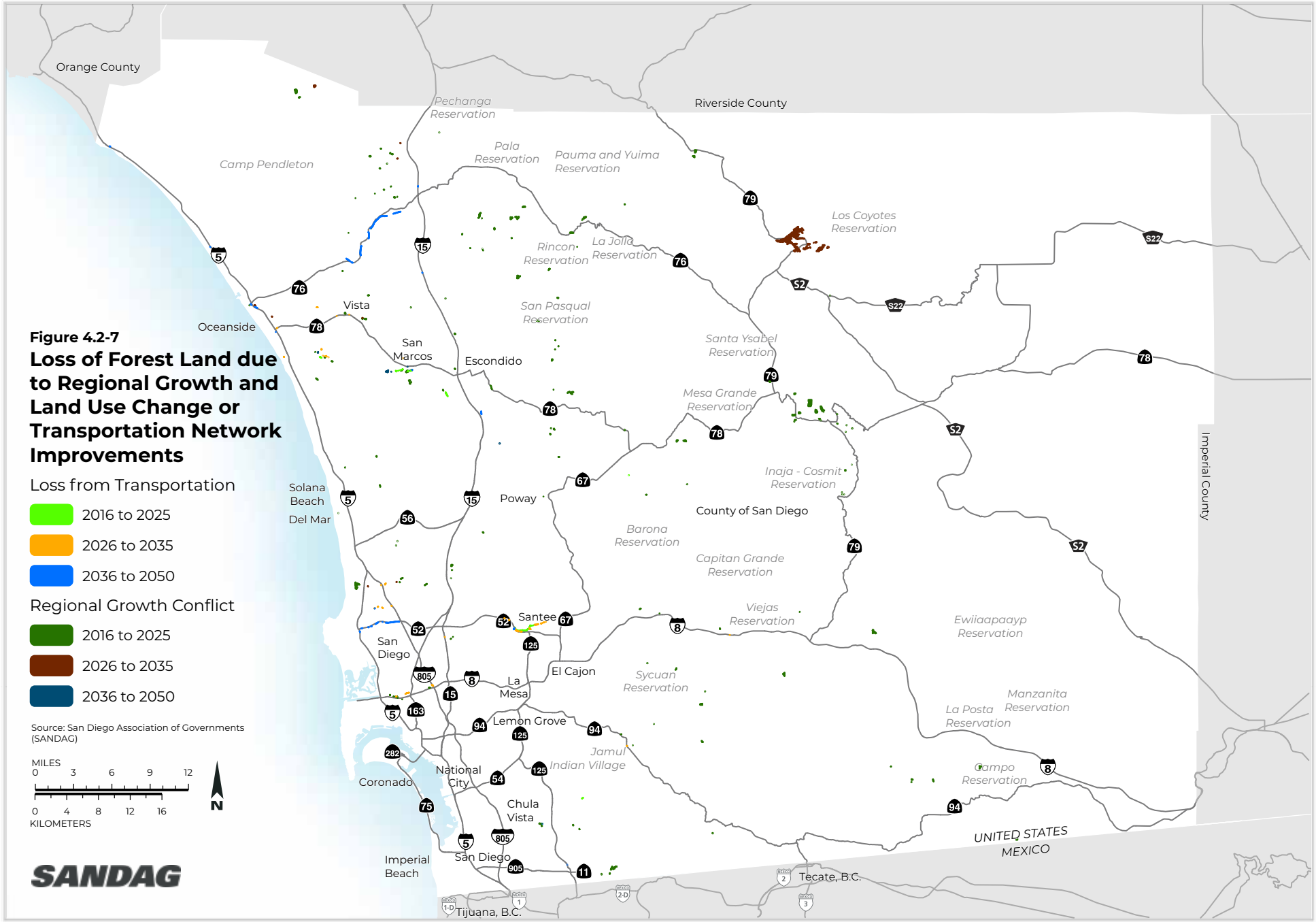
2025

Regional Growth and Land Use Change

As shown in Table 4.2-11, between 2016 and 2025, regional growth and land use changes would result in the loss of approximately 1,162 acres of forest lands. These impacts are scattered around the northern and eastern parts of the county. See Figure 4.2-7 for locations of these impacts. While adherence to the Federal Forest Legacy Program and the FRAP—as well as additional existing laws, regulations, and programs discussed in Section 4.2.2—would reduce impacts on forest land, regional growth and land use changes would still decrease the acreage of, and have adverse indirect impacts on, forest lands. Indirect impacts may occur on forest lands in proximity to areas converted from undeveloped to developed land uses from regional growth and land use change. Changes in hydrology, runoff, sedimentation, fugitive dust, and edge effects (e.g., exotic plant invasion, parasites, disturbance from human activities, pesticides, fuel modification) can degrade forest lands. This is a significant impact.

Table 4.2-11
Loss of Forest Land from Regional Growth and Land use Change, All Years

Agricultural Category	Acres of Loss				
	Conversion by Phase Years			Cumulative Impacts	
	2016–2025	2026–2035	2036–2050	2016–2035	2016–2050
Forest Land	1,162	171	0	1,333	1,333


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Jamul Indian Village
Campo Reservation
Vista
Oceanside
San Marcos
Escondido
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tecate, B.C.
Tijuana, B.C.
Figure 4.2-7
Loss of Forest Land due to Regional Growth and Land Use Change or Transportation Network Improvements
Loss from Transportation
2016 to 2025
2026 to 2035
2036 to 2050
Regional Growth Conflict
2016 to 2025
2026 to 2035
2036 to 2050
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Transportation Network Improvements and Programs

The proposed Plan includes a variety of network improvements and programs between 2016 and 2025. Although many of the proposed transportation improvements would occur within already established transportation corridors, ground-disturbing activities such as brush clearing, grading, trenching, excavation, and/or soil removal of any kind, associated with transportation improvements would impact forest lands and other vegetation communities. As shown in Table 4.2-12, between 2016 and 2025, transportation network improvements would result in the loss of approximately 8 acres of forest lands. These impacts would mostly be from local roadway projects such as the San Marcos Discovery St Widening and Flood Control Improvements, and trail projects such as the San Diego River Trail Carlton Oaks Segment. See Figure 4.2-7 for locations of these impacts. This is a significant impact.

Table 4.2-12
Loss of Forest Land from Transportation Network Improvements and Programs, All Years

	Acres of Loss				
	Conversion by Phase Years			Cumulative Impacts	
Agricultural Category	2016–2025	2026–2035	2036–2050	2016–2035	2016–2050
Forest Land	8	12	13	20	33

2025 Conclusion

Between 2016 and 2025, regional growth and land use change and transportation network improvements and programs would result in a direct loss of approximately 1,170 acres of forest land. This impact (FR-1) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

As shown in Table 4.2-11, between 2026 and 2035 regional growth and land use change would result in loss of approximately 171 acres of forest lands. The majority of these impacts are located along SR 79 north of SR 52. See Figure 4.2-7 for locations of these impacts. Between 2016 and 2035, about 187 total acres of forest land would cumulatively be lost. As discussed above, adherence to existing laws, regulations, and programs would reduce impacts, both direct and indirect, on forest lands upon implementation of the proposed Plan. However, it cannot be concluded at the current level of analysis that all impacts would be fully avoided or reduced to below a level of significance. This is a significant impact.

Transportation Network Improvements and Programs

The proposed Plan includes a variety of network improvements and programs between 2026 and 2035. As discussed above, construction activities associated with transportation improvements would impact forest lands and other vegetation communities. As shown in Table 4.2-12, between 2026 and 2035, transportation network improvements would result in a loss of approximately 12 acres of forest lands. Year 2035 impacts would be from local roadway projects, freeway projects and trail projects throughout the County. See Figure 4.2-7 for locations of these impacts. Between 2016 and 2035, about 20 total acres of forest land would be cumulatively lost due to transportation network improvements. This is a significant impact.

2035 Conclusion

Between 2026 and 2035, implementation of regional growth and land use change and transportation network improvements and programs would result in a direct loss of approximately 183 acres of forest land. Between 2016 and 2035, about 1,353 total acres of forest land would be cumulatively lost. This impact (FR-1) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

As shown in Table 4.2-11, between 2036 and 2050, regional growth and land use change would not result in loss forest lands. However, between 2016 and 2050, about 1,333 total acres of forest land would be cumulatively lost. See Figure 4.2-7 for locations of these impacts. As discussed above, adherence to existing laws, regulations, and programs would reduce impacts, both direct and indirect, on forest lands upon implementation of the proposed Plan. However, it cannot be concluded at the current level of analysis that all impacts would be fully avoided or reduced to a level below significance. This is a significant impact.

Transportation Network Improvements and Programs

The proposed Plan includes a variety of network improvements and programs between 2036 and 2050. As discussed above, construction activities associated with transportation improvements would impact forest lands and other vegetation communities. Between 2036 and 2050, transportation network improvements would result in a loss of approximately 13 acres of forest lands. Year 2050 impacts would be from commuter rail projects, freeway projects, and trail projects throughout the County. See Figure 4.2-7 for locations of these impacts. Between 2016 and 2050, about 33 total acres of forest land would be cumulatively lost due to transportation network improvements. This is a significant impact.

2050 Conclusion

Between 2036 and 2050, regional growth and land use change and transportation network improvements and programs associated with the proposed Plan would result in the loss of approximately 13 acres of forest land. Between 2016 and 2050, about 1,366 total acres of forest land would be lost. This impact (FR-1) in the year 2050 is significant.

Exacerbation of Climate Change Effects

The proposed Plan would exacerbate climate change effects on the conversion or loss of forest land. Climate change could result in higher temperatures, increased wildfire risk, increased spread of pests, increased drought, and increased flooding, all of which could damage or destroy forest lands (Bright et al. 2018). Wildfires in the southwestern United States have converted forest to woodland or grassland in the past (Melillo et al. 2014), and wildfire risk is expected to increase under climate change. Increased drought and the spread of pests are also likely to weaken trees, making them even more susceptible to wildfire (Bright et al. 2018).

The proposed Plan is also projected to convert forest land due to development and transportation network improvements. Furthermore, increased development that occurs near forests as part of the proposed Plan could increase the risk of wildfire ignition due to expansion of the wildland-urban interface or increased human activity near forests. This could result in more wildfires in the future that convert forests to other ecosystem

types (Melillo et al. 2014). The proposed Plan will thus exacerbate climate change effects that result in loss of forest land.

MITIGATION MEASURES

FR-1 CONVERT OR RESULT IN THE LOSS OF "FOREST LAND" AS DEFINED IN THE CALIFORNIA FOREST LEGACY ACT OF 2007 (PUBLIC RESOURCES CODE SECTION 12220(G))

2025, 2035, and 2050

Implementation of mitigation measures **BIO-1a, Implement Design, Minimization, and Avoidance Measures for Sensitive Natural Communities and Regulated Aquatic Resources; BIO-1b, Provide Compensatory Mitigation;** and **BIO-1e, Implement Best Management Practices to Avoid Indirect Impacts**, as discussed in detail in Section 4.4 will also reduce impacts on forest lands.

FR-1 Reduce Impacts on Forest Lands. During project planning, design, and project-level CEQA review of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, preserve forest lands by avoiding conversion of such lands when feasible and, if not feasible, by implementing measures to reduce impacts on forest lands, including, but not be limited to, the following:

- **Implement Compensatory Mitigation of Forest Lands**. Provide compensatory mitigation using mitigation ratios as specified through consultation with resource agencies and in approved natural community conservation plans (NCCPs) and habitat conservation plans (HCPs). Compensatory mitigation outside the Coastal Zone would be provided either through the purchase of credits at an existing authorized mitigation bank or in lieu fee program, or through project-specific mitigation. Compensatory mitigation for impacts inside the Coastal Zone may not be satisfied through in lieu fee programs and is required to be located within the Coastal Zone close to the impact. To the extent allowed by the above plans and ordinances, project-specific mitigation would be provided through onsite restoration of temporary impacts, onsite or offsite preservation of existing habitats, or offsite restoration.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of the proposed Plan would result in significant forest lands impacts. While implementation of mitigation measure FR-1, BIO-1a, BIO-1b, and BIO-1e, would reduce direct and indirect impacts on forest lands, there is no assurance that the impacts of all development and transportation network improvement projects implementing the proposed Plan would be reduced to less-than-significant levels. Therefore, direct and indirect impacts on forest lands would remain significant and unavoidable.

4.3 AIR QUALITY

This section evaluates the potential impacts of the proposed Plan related to air quality. See Appendix D for more details on the air quality technical analysis.

4.3.1 EXISTING CONDITIONS

TOPOGRAPHY AND CLIMATE

The proposed Plan is within the San Diego Air Basin (SDAB), which includes all of the County of San Diego. The SDAB covers roughly 4,200 square miles, lies in the southwest corner of California, and encompasses all of the county. The region's population and emissions are concentrated mainly in the western portion of the county (SDAPCD 2019a).

Topography

The topography of the San Diego region is highly varied, comprising coastal plains and lagoons, flatlands and mesas, broad valleys, canyons, foothills, mountains, and deserts. Generally, building structures can be found on and in the flatlands, mesas, and valleys, while the canyons and foothills tend to be sparsely developed. This segmentation has led to the region being a conglomeration of separate cities with mostly low-density housing and an automobile-centric character.

The topography is unique and varied. To the west are the region's beaches and the Pacific Ocean, to the south is Tijuana, Mexico, and the Baja California Peninsula, to the near east are the mountains, to the far east is the desert (the Salton Sea Air Basin), and to the north is the South Coast Air Basin (the greater Los Angeles-Riverside-San Bernardino area).

The topography also drives the pollutant levels. The SDAB is not classified as a contributor, but it is classified as a transport recipient. The transport pollutants are ozone (O_3), nitrogen oxides (NO_X) and volatile organic compounds (VOCs) that are transported from the South Coast Air Basin to the north and, when the wind shifts direction, Tijuana, Mexico, to the south (SDAPCD 2019a).

Climate

The climate of San Diego is classified as Mediterranean but is incredibly diverse because of the topography. The climate is dominated by the Pacific High-pressure system that results in mild, dry summers and mild, wet winters. San Diego experiences an average of 201 days above 70°F and 9–13 inches of rainfall annually (mostly, November–March). El Niño and La Niña patterns have large effects on the annual regional rainfall.

An El Niño is a warming of the surface waters of the eastern Pacific Ocean. It is a climate pattern that occurs across the tropical Pacific Ocean that is associated with drastic weather occurrences, including enhanced rainfall in Southern California. La Niña is a term for cooler than normal sea surface temperatures across the Eastern Pacific Ocean. San Diego receives less than normal rainfall during La Niña years.

The Pacific High drives the prevailing winds in the SDAB. The winds tend to blow onshore in the daytime and offshore at night. In the summer, an inversion layer is created over the coastal areas and increases the O_3 levels. In the winter, San Diego often experiences a shallow inversion layer, which tends to increase carbon monoxide

and PM2.5 (particulate matter smaller than or equal than 2.5 microns in diameter) concentration levels due to the increased use of residential wood burning.

In the fall months, the SDAB is often affected by Santa Ana winds. These winds are the result of a high-pressure system over the Nevada-Utah region that overcomes the westerly wind pattern and forces hot, dry winds from the east to the Pacific Ocean. These winds are powerful and incessant. They blow the air basin's pollutants out to sea. However, a weak Santa Ana can transport air pollution from the South Coast Air Basin and greatly increase the San Diego O_3 concentrations. A strong Santa Ana also primes the vegetation for firestorm conditions (SDAPCD 2019a).

POLLUTANTS OF CONCERN

The analysis for air quality focuses on the following two types of air pollutants that are of greatest concern for the Plan Area:

- **Criteria Pollutants.** Pollutants for which the United States Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have set ambient air quality standards or that are chemical precursors to compounds for which ambient standards have been set. The criteria pollutants associated with Plan implementation are O_3 and the precursors thereof (VOC and NO_X), particulate matter (PM) (PM10 is PM smaller than or equal to 10 microns in diameter and PM2.5 is PM smaller than or equal than 2.5 microns in diameter), carbon monoxide (CO), and sulfur dioxide (SO_2).
- **Toxic Air Contaminants.** The EPA has identified nine air toxic compounds associated with mobile sources as the considerable contributors to background air quality concerns. The toxic air contaminants associated with Plan implementation are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (DPM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter.

Criteria Pollutants

The federal and state governments have established the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for six criteria pollutants: O_3, lead (Pb), CO, nitrogen dioxide (NO_2), SO_2, and PM10 and PM2.5. The NAAQS and CAAQS for these six criteria pollutants were established with the goal of protecting the public's health from air pollution. O_3 is considered a regional pollutant because its precursors affect air quality on a regional scale. Pollutants such as CO, NO_2, SO_2, and Pb are considered local pollutants that tend to accumulate in the air locally. PM is both a local and a regional pollutant. The primary criteria pollutants of concern generated by the proposed Plan are ozone precursors (VOC and NO_X), CO, and PM.

All criteria pollutants can have human health and environmental effects at certain concentrations. The ambient air quality standards for these pollutants (Table 4.3-1) are set to protect public health and the environment within an adequate margin of safety (Clean Air Act Section 109). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants, and form the scientific basis for new and revised ambient air quality standards.

Principal characteristics and possible health and environmental effects from exposure to the primary criteria pollutants potentially generated by the proposed Plan are discussed below.

- **Ozone,** a component of urban smog, is photochemical oxidant that is formed when VOC and NO_X (both byproducts of the internal combustion engine) react with sunlight. VOC are compounds made up primarily

of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of VOC are emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. The two major forms of NO_X are nitric oxide (NO) and NO_2. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown irritating gas formed by the combination of NO and oxygen. In addition to serving as an integral participant in ozone formation, NO_X also directly acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens.

Ozone poses a higher risk to those who already suffer from respiratory diseases (e.g., asthma), children, older adults, and people who are active outdoors. Exposure to ozone at certain concentrations can make breathing more difficult, cause shortness of breath and coughing, inflame and damage the airways, aggregate lung diseases, increase the frequency of asthma attacks, and cause chronic obstructive pulmonary disease. Studies show associations between short-term ozone exposure and non-accidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths (EPA 2019a). The concentration of ozone at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrement in forced airway volume in the most responsive individual. Although the results vary, evidence suggests that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion (EPA 2019b). The CAAQS and NAAQS for ozone are shown in Table 4.3-1.

In addition to human health effects, ozone has been tied to crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death. Ozone can also act as a corrosive and oxidant, resulting in property damage such as the degradation of rubber products and other materials.

- **Nitrogen Oxides** is formed by the combination of NO and oxygen through internal combustion. Long-term exposure to NO_2 can aggregative respiratory diseases, such as asthma, leading to increased hospital admissions (EPA 2016b). Controlled studies demonstrate effects (airway reactivity) among asthmatics at a short-term (less than 3 hours) exposure to 0.3 parts per million (ppm) NO_2. Effects among healthy individuals occurred at high levels of exposure (1.5 to 2 ppm) (McConnell et al. 2002). For reference, the 1-hour CAAQS for NO_2 is 0.18 ppm (see Table 4.3-1). In additional to human health effects, NO_2 can also reduce visibility and react with water, oxygen, and other chemicals to contribute to acid rain, which can harm sensitive ecosystems (EPA 2016b).
- **Carbon Monoxide** is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. In the Plan Area, high CO levels are of greatest concern during the winter, when periods of light winds combine with the formation of ground-level temperature inversions from evening through early morning. These conditions trap pollutants near the ground, reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emission rates at low air temperatures. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation. Exposure to CO at concentrations above the CAAQS or NAAQS (see Table 4.3-1) can also cause fatigue, headaches, confusion, dizziness, and chest pain. There are no ecological or environmental effects to ambient CO (CARB 2020a).
- **Particulate Matter** consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now regulated—inhalable coarse particles, or PM10, and inhalable fine particles, or PM2.5. Particulate discharge into the atmosphere results primarily from industrial,

agricultural, construction, and transportation activities. However, wind on arid landscapes also contributes substantially to local particulate loading. Additionally, secondary formation of PM, primarily in the form of fine particulate, occurs through the chemical transformation of precursors such as NO_X, SO_2, ammonia, and VOCs.

Particulate pollution can be transported over long distances and may adversely affect humans, especially people who are naturally sensitive or susceptible to breathing problems. Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease. Other symptoms of exposure may include nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lunch function, and increased respiratory symptoms. Exposure to concentrations of PM above the current ambient air quality standards may result in these health effects (EPA 2020a). Similar to O_3, the elderly and those with preexisting heart and lung diseases are at greater risk to the harmful effects of PM exposure. Children are also at increased risk because they breathe faster than adults, and therefore inhale more air per pound of body weight and tend to spend more time outdoors. The CAAQS and NAAQS for PM are set to protect these sensitive populations and define the number of particles that can be present in outdoor air without threatening the health of infants, children, or the elderly (CARB 2020b). The CAAQS and NAAQS for PM are shown in Table 4.3-1.

Depending on its composition, both PM10 and PM2.5 can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (EPA 2020a).

- **Sulfur dioxide** is a product of fuel combustion. The predominant source of SO_2 emissions within the San Diego region is mobile source fuel combustion, primarily aircraft, ocean-going vessels, and onroad vehicles. In recent years emissions of SO_2 have been significantly reduced by the increasingly stringent controls placed on the sulfur content of fuels used in stationary sources and mobile sources. SO_2 is a precursor to fine PM formation in the form of sulfates, such as ammonium sulfate. Short-term exposure to SO_2 can aggravate the respiratory system, making breathing difficult. Controlled laboratory studies indicate that brief exposure (5 to 10 minutes) of exercising asthmatics to an average SO_2 level of 0.4 ppm can result in increases in air resistance. Healthy adults do not show any symptoms to SO_2 at levels as high 1 ppm, even after up to 3 hours of exposure. Based on the concentration needed to protect sensitive individuals (e.g., asthmatics), CARB and EPA have adopted the CAAQS and NAAQS for SO_2 (see Table 4.3-1) (SCAQMD 2017). In addition to public health impacts, SO_2 can also affect the environment by damaging foliage and decreasing plant growth (EPA 2019b).
- **Lead** is a soft metal that was previously added to gasoline and emitted to the environment through motor vehicle exhaust. Since lead was removed from gasoline, emissions have declined, and the primary source of emissions is now metal processing facilities and leaded aviation gasoline. Lead can also be resuspended into the air when contaminated soil or paints are disturbed. Lead emissions can be inhaled and ingested, leading to accumulation of lead particles in bone. Lead exposure can lead to cognitive function decrements, behavioral problems, kidney and heart disease, decreased immunity and red blood cell counts, and reproductive and developmental effects (CARB 2020e).

CAAQS have been established for other criteria pollutants, including Sulfates, Hydrogen Sulfide, and Vinyl Chloride (see Table 4.3-1). However, these criteria pollutants are not affected by the proposed Plan and are not quantified. Vinyl Chloride is associated with industrial processes, such as polyvinyl chloride (PVC) plastic and vinyl product production. Hydrogen Sulfide is associated with natural gas extraction and processing, and natural emissions from geothermal fields. Moreover, while sulfates are primarily emitted from fossil fuel combustion, sulfates are part of PM2.5; thus, they are included in PM2.5 estimates herein. Additionally, while

lead is both a CAAQS and a NAAQS, Lead emissions are not present in current fossil fuels, and are primarily associated with manufacturing, some aviation fuels, and battery recycling and manufacturing plants.

Toxic Air Contaminants

TACs are pollutants that have no ambient standard but pose the potential to increase the risk of developing cancer or acute or chronic health risks. The most relevant TAC associated with the proposed Plan is DPM. For TACs that are known or suspected carcinogens, CARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Therefore, no NAAQS or CAAQS exist for TACs. Individual TACs vary greatly in the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). Adverse health effects of TACs can be carcinogenic (cancer-causing), short-term (acute) noncarcinogenic, and long-term (chronic) noncarcinogenic. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders.

The State Air Toxics Program (Assembly Bill [AB] 2588) identified over 200 TACs. EPA has assessed this expansive list of toxics and identified a master list of TACs as Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

EPA has assessed this expansive list in their rule on the Control of Hazardous Air Pollutants from Mobile Sources (*Federal* Register [FR], Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System. In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national- and regional-scale cancer risk drivers from their 2014 National Air Toxics Assessment (NATA) (EPA 2018). These nine compounds, considered "priority" MSATs, are acrolein, acetaldehyde, benzene, 1,3-butadiene, DPM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter (POM) (FHWA 2016).

The California-specific transportation air quality analysis model, CT-EMFAC, is designed to model MSATs. However, CT-EMFAC does not have the most recent speciation data for POM and naphthalene. To use a consistent source and rely on current data for speciation factors for all MSATs and the different vehicle and fuel types, the speciation factors from EPA's MOVES2014b mobile source emission model; current at the time of analysis, were used for all on-road mobile sources, instead of CT-EMFAC (EPA 2015a, 2016).

Health effects from MSATs/TACs, including cancer and chronic noncancer risks from on-road traffic, have been associated primarily with diesel PM, benzene, and 1, 3-butadiene. In addition to these three compounds, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient TAC risk for which data are available within California.

Diesel Particulate Matter Exposure and Human Health Impacts

Most of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being DPM. DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of

hundreds of substances. DPM is emitted from both mobile and stationary sources. Diesel exhaust is composed of two phases, gas and particle, and both phases contribute to the health risk. The gas phase is composed of many of the urban TACs, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, and polycyclic aromatic hydrocarbons. The particle phase is also composed of many different types of particles by size or composition. Fine and ultra-fine diesel particulates are of the greatest health concern and may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals, and other trace elements.

Exposure to DPM comes from both on-road and off-road engine exhaust that is either directly emitted from the engines or aged through lingering in the atmosphere. Diesel exhaust causes health effects from both short-term or acute exposures, and long-term chronic exposures. The type and severity of health effects depend upon several factors, including the amount of chemical exposure and the duration of exposure. Individuals also react differently to different levels of exposure.

DPM emissions are believed to be responsible for about 70 percent of California's estimated known cancer risk attributable to TACs. DPM comprises about 8% of outdoor PM2.5 concentrations, which is a known health hazard. DPM contributes to numerous health impacts that have been attributed to PM exposure, including increased hospital admissions, particularly for heart disease, but also for respiratory illnesses, and even premature death. CARB estimates that diesel PM contributes to approximately 1,400 (95 percent confidence interval: 1,100-1,800) premature deaths from cardiovascular disease annually in California. Additionally, exposure to diesel exhaust may contribute to the onset of new allergies; a clinical study of human subjects has shown that diesel exhaust particles, in combination with potential allergens, may actually be able to produce new allergies that did not exist previously (CARB 2021b).

Ultrafine Particulate Matter

Ultrafine particulate matter (UFP) refers to a subfraction of currently regulated PM2.5 and PM10 size particles. Although the operational definition of UFP varies in the scientific literature, it is generally accepted that particles with size less than 100 nanometers (0.1 micrometer) are labeled as UFPs. Although UFPs contribute only a small amount to total PM mass, they have a large surface area and often very high concentrations. Because of its small size, a given mass of UFP contains thousands to tens of thousands more particles, with a correspondingly larger surface area, than an equivalent mass of PM2.5 or PM10. This means that a given mass of UFP can impact a larger surface area of lung tissue than equal mass of PM2.5 or PM10, thus increasing exposure (EPA 2017a). The predominant source of UFP is combustion by on-road vehicles, off-road vehicles, and stationary sources (CARB 2006). Concentrations of UFP have been found to be substantially higher at locations proximate to and downwind of high-volume roadways, particularly roadways travelled by diesel-powered vehicles (Health Effects Institute 2013). Studies have also shown that commuters using non-automobile travel (e.g., bicycles) have a higher risk of exposure and adverse health impacts if commuting is performed along roadways (Panis et al. 2010). Moreover, evidence suggests that UFP can penetrate the microclimate within vehicles, causing increasingly more exposure to UFP among those with long commutes (Bigazzi and Figliozzi 2012).

Other Air Toxics

Other TACs are emitted from combusting non-diesel fuels, primarily gasoline. In total, the Federal Highway Administration (FHWA) has identified nine priority TACs from mobile sources, which are called mobile source air toxics (FHWA 2016):

- 1,3-butadiene
- Acetaldehyde
- Acrolein
- Benzene
- DPM
- Ethylbenzene
- Formaldehyde
- Naphthalene
- Polycyclic organic matter (POM)

CARB notes that DPM, which is composed of black carbon and numerous organic compounds (i.e. polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene) is responsible for 70 percent of the total known cancer risk related to air toxics in California (CARB 2021c).

Odors

Odor sources commonly associated with negative human response include wastewater treatment plants, sanitary landfills, composting facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting operations, rendering plants, food packaging plants, and cannabis growers. Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

Sensitive Receptors

Sensitive receptors are defined as locations where pollutant-sensitive members of the population may reside or where the presence of air pollutant emissions could adversely affect use of the land. CARB has identified the following people as the most likely to be affected by air pollution: children younger than 14, the elderly older than 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors (CARB 2005). Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder-care facilities, elementary schools, and parks. Most health studies indicate that health effects are strongest within 1,000 feet of emission sources (CARB 2005).

AMBIENT AIR QUALITY CONDITIONS

The federal Clean Air Act (CAA) requires EPA to designate areas within the country as either attainment or nonattainment for each criteria pollutant based on whether the NAAQS have been achieved. Similarly, the California CAA (CCAA) requires CARB to designate areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. If a pollutant concentration is lower than the state or federal standard, the area is classified as being in attainment for that pollutant. If a pollutant violates the standard, the area is considered a nonattainment area. If data are insufficient to determine whether a pollutant is violating the standard, the area is designated unclassified. Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data show that a state standard for the pollutant was violated at least once during the previous 3 calendar years. Exceedances that

are affected by highly irregular or infrequent events are not considered violations of a state standard and are not used as a basis for designating areas as nonattainment. CAAQS and NAAQS as well as the attainment status for each in the county is summarized in Table 4.3-1.

Table 4.3-1
State and Federal Attainment Air Quality Standards and Attainment Status for the San Diego Region

Pollutant	Averaging Time	State Standard[1]	Federal Standard[2]	State Designation[3]	Federal Designation[4]
Ozone (O_3)	1 hour	0.09 ppm[3]	--	--	Attainment
	8 hour	0.070 ppm	0.070 ppm (2015) 0.075 ppm (2008)	Nonattainment	Moderate Nonattainment (2015) ~~Serious~~ Severe Nonattainment (2008)[5]
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Attainment	Attainment
	8 hour	9.0 ppm	9 ppm	Attainment	Attainment
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	100 ppb	Attainment	Attainment
	Annual Arithmetic Mean	0.030 ppm	53 ppb	Attainment	Attainment
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	75 ppb	Attainment	Attainment
	24 hour	0.04 ppm	0.14 ppm	Attainment	Attainment
Respirable Particulate Matter (PM10)	24 hour	50 µg/m^3	150 µg/m^3	Nonattainment	Unclassifiable/ Attainment
	Annual Arithmetic Mean	20 µg/m^3	--	Nonattainment	--
Fine Particulate Matter (PM2.5)	24 hour	--	35 µg/m^3	Nonattainment	--
	Annual Arithmetic Mean	12 µg/m^3	12.0 µg/m^3	Nonattainment	Attainment
Sulfates	24 hour	25 µg/m^3	--	Attainment	No Federal Standard
Lead (Pb)	30 day average	1.5 µg/m^3	--	Attainment	--
	Calendar quarter	--	1.5 µg/m^3	--	Attainment
	Rolling 3-Month Average	--	0.15 µg/m^3	--	Attainment
Hydrogen Sulfide	1 hour	0.03 ppm	--	Unclassified[4]	No Federal Standard
Vinyl Chloride	24 hour	0.01 ppm	--	Unclassified[4]	No Federal Standard

Sources: EPA 2021b, SDAPCD 2019a

[1] The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM10, and PM2.5 are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

[2] The NAAQS, other than O_3 and those based on annual averages, are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years,

is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, is equal to or less than the standard.

[3] State and federal designations are based on San Diego Air Pollution Control District's attainment status webpage and the EPA's Greenbook, which was accessed in July 2021.

[4] At the time of designation, if the available data do not support a designation of attainment or nonattainment, the area is designated as unclassifiable.

[5] Separate ozone standards were promulgated in 2015 (0.070 ppm) and 2008 (0.075 ppm). San Diego County has not met either standard, and is classified as nonattainment for both standards. Thus, both standards remain in effect.

ppm = parts per million by volume; ppb = parts per billion; µg/m^3 = micrograms per cubic meter.

Air quality is monitored at various monitoring sites throughout the region. Monitoring is performed by the San Diego Air Pollution Control District (SDAPCD). The monitoring network has been designed to provide criteria pollutant monitoring coverage to the majority of the inhabited areas of the region. The purpose of air monitoring is to identify areas where pollutant levels exceed federal and state ambient air quality standards, then develop strategies and regulations to achieve the emission reductions necessary to meet all NAAQS and CAAQS. Data from the ambient monitoring network are then used to indicate the success of the regulations and control strategies in terms of the rate of progress towards attaining the standards or to demonstrate that standards have been attained and maintained.

Table 4.3-2 below shows the ambient air quality monitoring stations operated by the SDAPCD and the pollutants measured at each.

Annual air quality data from the monitoring stations are summarized in SDAPCD's Annual Reports and Five-Year Air Quality Summary. The most recent annual report at the time of Draft EIR preparation was the 2020 Annual Report, which summarizes monitoring concentrations, exceedances, and the number of days during the 2015 to 2019 time period (SDAPCD 2020). Monitoring data are also reported to CARB and maintained within CARB's statewide Aerometric Data Analysis and Management (ADAM) air quality database (CARB 2020d). The Annual Report provides data by monitoring station, whereas the ADAM database provides a summary of the data for the entire SDAB. A summary of SDAB data from the ADAM database is provided in Table 4.3-3 for all pollutants except CO and SO_2. SO_2 and CO are not reported air basin–wide within the ADAM database; therefore, the maximum measured concentrations from specific monitoring stations (e.g., El Cajon-Lexington Elementary School for SO_2) are reported in Table 4.3-3.

Table 4.3-2
Ambient Air Monitoring Stations in the San Diego Region

Monitoring Station	Pollutant Measured						
	O_3	PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	Lead
Alpine	✓		✓		✓		
Camp Pendleton	✓		✓		✓		
Chula Vista	✓	✓	✓		✓		
Donovan-Otay Mesa	✓	✓	✓		✓		
El Cajon-Lexington Elementary School	✓	✓	✓	✓	✓	✓	
Kearny Mesa-Kearny Villa Road	✓	✓	✓		✓		
Palomar-McClellan Airport							✓
San Diego-Rancho Carmel Drive				✓	✓		
San Diego-Sherman Elementary	✓		✓		✓		

Source: SDAPCD 2019a

Table 4.3-3
Summary of Annual Ambient Air Quality Data (2014–2019) – San Diego Air Basin

Pollutant Standards	2014	2015	2016	2017	2018	2019
Carbon Monoxide (CO)[1]						
Maximum concentration (1-hour, ppm)	2.7	2.4	2	2	1.9	4.1
Number of days state standard exceeded (1-hour)	0	0	0	0	0	0
Number of days national standard exceeded (1-hour)	0	0	0	0	0	0
Maximum concentration (8-hour, ppm)	1.9	1.4	1.2	1.5	1.4	2.5
Number of days state standard exceeded (8-hour)	0	0	0	0	0	0
Number of days national standard exceeded (8-hour)	0	0	0	0	0	0
Nitrogen Dioxide (NO_2)						
Maximum concentration (1-hour, ppm)	87	62	73	74	55	86
Number of days state standard exceeded (1-hour)	0	0	0	0	0	0
Number of days national standard exceeded (1-hour)	0	0	0	0	0	0
Annual Average (ppm)	13	14	17	16	15	14
Ozone (O_3)						
Maximum concentration (1-hour, ppm)	0.1	0.098	0.104	0.109	0.102	0.110
Number of days state standard exceeded (1-hour)	3	3	7	13	3	2
Maximum concentration (8-hour, ppm)	0.087	0.084	0.091	0.095	0.083	0.085
Number of days state standard exceeded (8-hour)	33	34	34	57	25	21
Number of days national standard exceeded (8-hour)	33	34	34	54	23	19
Particulate Matter (PM10)						
Maximum concentration (24-hour, $\mu g/m^3$)	59	136	79	68	55	199
Number of days state standard exceeded (24-hour)	3	10	9	4	3	8

Pollutant Standards	2014	2015	2016	2017	2018	2019
Number of days national standard exceeded (24-hour)	0	0	0	0	0	1
Annual average (µg/m^3)	30.2	34.8	31.4	26.9	26.3	31.4
Particulate Matter (PM2.5)						
Maximum concentration (24-hour, µg/m^3)	36.7	33.5	34.4	42.7	41.9	23.8
Number of days national standard exceeded (24-hour)	1	0	0	1	1	0
Annual average (µg/m^3)	10.2	9.3	8.7	9.6	10.0	8.6
Sulfur Dioxide (SO_2)[2]						
Maximum concentration (1-hour, ppm)	0.0012	0.0012	0.0018	0.0011	0.0035	0.0008
Number of days national standard exceeded (1-hour)	0	0	0	0	0	0
Maximum concentration (24-hour, ppm)	0.0005	0.0004	0.0005	0.0004	0.0004	0.0003
Number of days national standard exceeded (24-hour)	0	0	0	0	0	0
Annual average (ppm)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00007
Lead (Pb)						
Maximum calendar quarter (calendar quarter, µg/m^3)	0.010	0.015	0.010	0.020	0.020	0.036
Maximum 3-month rolling average (3-month, µg/m^3)	0.011	0.015	0.010	0.020	0.020	0.02
Number of days national standard exceeded	0	0	0	0	0	0

Sources: CARB 2020d, EPA 2020b, SDAPCD 2019a, SDAPCD 2019b.
[1] 2015–2019 CO values are from the Rancho Carmel Drive monitoring station; 2014 values are from the Beardsley Street monitoring station.
[2] 2014–2016 SO_2 values are from the Floyd Smith Drive monitoring station; 2017–2019 values are from the 533 First Street monitoring station.

Attainment Status

As noted in Table 4.3-1, the San Diego region is currently designated as a ~~serious~~ severe nonattainment area for the 2008 8-hour O_3 NAAQS and a moderate nonattainment area for the 2015 8-hour O_3 NAAQS. Accordingly, the SDAPCD (discussed in more detail below) is required to prepare and submit to the EPA, through CARB, a plan identifying control measures and associated emission reductions as necessary to demonstrate attainment for each O_3 standard as part of the State Implementation Plan (SIP). The 2016 Eight-Hour O_3 Attainment Plan (2016 SIP) addresses the requirements for attaining the 2008 8-hour O_3 NAAQS. The 2020 Plan for Attaining the National Ozone Standards (2020 SIP) addresses the requirements for attaining the 2008 and 2015 8-hour O_3 NAAQS. The 2016 SIP complies with the moderate nonattainment area classification for the planning requirements and includes demonstrations for attainment of the 2008 O_3 NAAQS by July 20, 2018 (2017 attainment year). Despite substantial air quality progress, the region did not attain the 2008 O_3 NAAQS (75 ppb) by the attainment deadline; as a result, EPA reclassified San Diego County as a ~~serious~~ severe nonattainment area for that standard with a new attainment date of July 20, 2027 (2026 attainment year).

Furthermore, the 2020 SIP complies with the severe nonattainment Area classification planning requirements and includes demonstrations for attainment of the 2008 and 2015 O_3 NAAQS by 2026 and 2032, respectively. The 2020 SIP includes updated inventories of O_3 precursor emissions (VOC and NO_X) for the 2017 base year (the year from which future-year inventories are projected) and the 2026 and 2032 attainment years (SDAPCD 2020).

Section 2.1 of the 2016 SIP identifies emission budgets for transportation conformity, and Section 3.1.2 of the 2020 SIP identifies Emission Budgets for transportation conformity. The conformity budgets for O_3 precursors NO_X and VOC were developed in consultation with SANDAG, SDAPCD, CARB, and the EPA based on vehicle miles travel (VMT) data provided by SANDAG. The modeling for the conformity budgets in the 2020 SIP indicates that by 2026, on-road motor vehicle NO_X and VOC emissions in the San Diego region are projected to decrease 54 percent relative to 2017 levels (SDAPCD 2020).

As for other NAAQS, the San Diego region became an attainment area (along with every other area of the state except South Coast) for CO on June 1, 2018, following a 20-year maintenance period. Accordingly, because conformity only applies to nonattainment and maintenance areas, transportation conformity requirements for CO ceased on June 1, 2018 (EPA 2018b). The San Diego region is in attainment for all other NAAQS, including NO_2, O_3, PM10 and PM2.5, SO_2, and Pb.

Local Air Quality

CARB has developed the California Emissions Projection Analysis Model (CEPAM), which provides historical data as well as projections of future year emissions at different scales of interest in the state. Table 4.3-4 presents the emissions inventory for the SDAB for the year 2016 based by CEPAM emission category.

Table 4.3-4
Criteria Pollutant Emissions Inventory for 2016 – San Diego Air Basin

	Emissions (tons per day)					
Emission Category	**ROG**	**CO**	**NO_X**	**SO_X**	**PM10**	**PM2.5**
Fuel Combustion	0.96	13.63	3.40	0.25	1.08	1.07
Waste Disposal	2.42	0.12	0.30	0.05	1.71	0.42
Cleaning and Surface Coatings	16.00	--	--	--	--	--
Petroleum Production and Marketing	6.73	0.01	0.01	--	--	--
Industrial Processes	3.66	0.35	0.23	0.02	4.73	0.97
Solvent Evaporation	27.44	--	--	--	0.01	0.01
Miscellaneous Processes	6.22	15.48	2.58	0.14	59.96	11.35
On-Road Motor Vehicles	24.03	187.85	48.27	0.42	5.26	2.45
Other Mobile Sources	25.00	168.39	27.74	0.30	3.36	3.06
Natural Sources	74.42	28.26	0.81	0.34	3.13	2.65
Total	186.88	414.09	83.33	1.53	79.23	21.97

Source: CARB 2018.

SOURCES OF AIR POLLUTION

Emissions are normally grouped into four main categories: stationary, area-wide, mobile, and natural sources. Generally, stationary- and area-wide sources are those attached to the ground, while mobile sources, as the

name implies, are those involved in the movement of people and goods. Natural emission sources refer to emissions that are non-anthropogenic (not human-caused) sources. Each of these categories is usually further divided into major source categories and then summary categories. The sections below provide a brief description of these four main categories.

Stationary Emission Sources

Stationary source emissions, also referred to as point-source emissions, are emissions from major industrial, manufacturing, and processing plants. This category also includes emissions from electric utilities; waste burning; solvent use; petroleum processing, storage, and transfer; and industrial processes.

Mobile Emission Sources

There are two major categories under mobile emissions:

- **On-Road Mobile Sources**: This major source category accounts for the emissions from all types of vehicles licensed to travel on public roads and highways. This includes passenger cars, light- and medium-duty trucks, heavy-duty gas and diesel trucks, heavy-duty urban diesel buses, and motorcycles.
- **Off-Road Mobile Sources**: This major category accounts for vehicular emissions from construction equipment, farm tractors, off-road recreational vehicles, trains, ships, aircraft, mobile equipment, utility equipment, and lawn mowers.

Area-Wide Emission Sources

Area-wide sources are those that individually emit small quantities, but collectively result in substantial emissions when aggregated over a larger area. Emissions result from landscaping; natural gas consumption; small industrial engines; solvent use in dry cleaning; auto repair, auto body, and paints; wood burning; industrial coatings; consumer products; printing; bakeries and restaurants; asphalt paving; and fugitive dust.

Natural Emission Sources

Natural sources are non-anthropogenic emission sources, which include biological and geological sources, wildfires, windblown dust, and biogenic emissions from plants and trees.

ANTICIPATED EFFECTS OF CLIMATE CHANGE

The San Diego region is likely to experience a variety of climate change impacts. These include wetter winters and more intense precipitation that can lead to increased flooding, more frequent and intense drought, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix F.

Climate change may worsen air quality in the San Diego region by influencing ozone, and wildfire. Quantitative estimates of the extent of this impact are not available for the region. Nationwide, assuming no change in regulatory controls or population characteristics, estimates of additional premature deaths per year by 2050 from combined ozone and particulate matter due to climate change range from 1,000–4,300 (Melillo et al. 2014).

Ozone forms through a combination of heat, precursor chemicals, and methane emissions (Reidmiller et al. 2018). Therefore, higher temperatures can lead to more ozone formation and thus to poorer air quality. Studies on the overall air quality impact to the San Diego region are not available. In general, given anticipated temperatures rises in the region, higher temperatures will increase ozone (Pfister et al. 2014).

Wildfires can emit particulate matter, carbon monoxide, nitrogen oxide, and other volatile organic compounds, further worsening air quality. The negative health impacts of wildfire smoke can spread across the San Diego region, exacerbating respiratory and asthma-related conditions (Reidmiller et al. 2018). A significant increase in the areas of wildfire is also projected for the San Diego region. Furthermore, precipitation during dry seasons, which can help fight wildfires and may play a part in clearing away air pollution (Kim et al. 2007), is projected to decrease due to climate change.

Climate change could increase the incidence of flooding and wildfire that may block routes and disrupt traffic; this could increase vehicle idling and thus increase the amount of particulate matter and SO_X coming from vehicles (WSP 2018).

Droughts, which are anticipated to be longer and more severe in the region, may also cause health and air quality issues by increasing levels of dust. In the southwestern United States, this can be dangerous due to the spores of the fungi *Coccidiodes*, which cause valley fever and reside in indoor and outdoor dust (Crimmins et al. 2016). However, the consequences of climate change on drought and resulting outdoor air quality in the San Diego region have not yet been quantified.

Climate change may also worsen the intensity of odors coming from landfills. After heavy rains, the Miramar Landfill in the City of San Diego has received complaints of odors from residents living nearby (Patton 2019). Studies on landfill odors have also shown that odor pollution is worse in high temperatures, high humidity, and low air pressure (Ying et al. 2012). Because temperatures and intense precipitation are expected to increase in the San Diego region, this may exacerbate air quality issues due to landfill odors in the future.

4.3.2 REGULATORY SETTING

The Plan Area is subject to air quality regulations developed and implemented at the federal, state, and regional levels. At the federal level, EPA is responsible for implementation of the CAA. Some portions of the CAA (e.g., certain mobile-source and other requirements) are implemented directly by EPA. Other portions of the CAA (e.g., stationary-source requirements) are implemented by state and local agencies.

Responsibility for attaining and maintaining air quality in California is divided between CARB and regional air quality districts. Areas of control for the regional districts are set by CARB, which divides the state into air basins. Plans, policies, and regulations relevant to the proposed Plan are discussed below.

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Federal Clean Air Act

The federal CAA, as amended, is the primary federal law that governs air quality nationwide. The CAA was first enacted in 1963 and has been amended numerous times in subsequent years (1967, 1970, 1977, and 1990). The CAA establishes the NAAQS and specifies future dates for achieving compliance. The CAA also mandates that each state submit and implement a SIP for local areas not meeting those standards. The plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. The sections of the CAA that would most substantially affect the development of the proposed Plan include Title I (Nonattainment Provisions) and Title II (Mobile-Source Provisions).

Title I provisions were established with the goal of attaining the NAAQS for criteria pollutants. Table 4.3-1 shows the NAAQS currently in effect for each criteria pollutant. The NAAQS were amended in July 1997 to include an 8-hour standard for O_3 and adopt a standard for PM2.5. The 8-hour O_3 NAAQS was further amended in October 2015.

The CAA requires that each state containing non-attainment areas develop SIPs to attain the NAAQS by a specified attainment date. California's SIP integrates non-attainment plans prepared by local air districts. Once the air quality standard is attained, air districts prepare maintenance plans to demonstrate continued maintenance of the NAAQS.

Corporate Average Fuel Economy Standards

The Corporate Average Fuel Economy Standards (CAFÉ) were first enacted in 1975 to improve the average fuel economy of cars and light duty trucks.

On August 2, 2018, the National Highway Traffic Safety Administrative (NHTSA) and EPA proposed to amend the fuel efficiency standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule). On September 19, 2019, EPA and NHTSA issued a final action on the One National Program Rule, which is consider Part One of the SAFE Vehicles Rule and a precursor to the proposed fuel efficiency standards. The One National Program Rule enables EPA/NHTSA to provide nationwide uniform fuel economy and greenhouse gas (GHG) vehicle standards, specifically by (1) clarifying that federal law preempts state and local tailpipe GHG standards, (2) affirming NHTSA's statutory authority to set nationally applicable fuel economy standards, and (3) withdrawing California's CAA preemption waiver to set state-specific standards.

EPA and NHTSA published their decisions to withdraw California's waiver and finalize regulatory text related to the preemption on September 27, 2019 (84 FR 51310). California, 22 other states, the District of Columbia, and two cities filed suit against Part One of the SAFE Vehicles Rule on September 20, 2019 (California et al. v. United States Department of Transportation et al., 1:19-cv-02826, U.S. District Court for the District of Columbia). On October 28, 2019, the Union of Concerned Scientists, Environmental Defense Fund (EDF), and other groups filed a protective petition for review after the federal government sought to transfer the suit to the D.C. Circuit (Union of Concerned Scientists v. National Highway Traffic Safety Administration).

EPA and NHTSA published final rules to amend and establish national CO_2 and fuel economy standards on April 30, 2020 (Part Two of the SAFE Vehicles Rule) (85 FR 24174). The revised rule changes the national fuel economy standards for light duty vehicles from 50.4 miles per gallon (mpg) to 40.5 mpg in future years. California, 22 other states, and the District of Columbia filed a petition for review of the final rule on May 27, 2020. This new rule rolls back California fuel efficiency standards for on-road passenger vehicles. California and 22 other states are currently challenging this new rule in the court system. Also, on January 20, 2021, the President signed Executive Order 13990. directing the government to revise fuel economy standards with the goal of further reducing emissions. In February 2021 the Department of Justice also asked courts to put the

state litigation on hold while the administration "reconsidered the policy decisions of a prior administration." More recently, on April 22, 2021, NHTSA proposed to formally roll back portions of the SAFE Rule, thereby restoring California's right to set more stringent fuel efficiency standards. NHTSA is also planning to issue a new rule to increase the national fuel economy standard for light duty vehicles beyond those in Part Two of the SAFE Vehicles Rule (NHTSA 2021). Moreover, on August 5, the President signed an Executive Order that targets to make half of all new vehicles sold in 2030 zero-emissions vehicles, including battery electric, plug-in hybrid electric, or fuel cell electric vehicles (White House 2021).

Transportation Conformity

Transportation conformity is required by the CAA Section 176(c) (42 United States Code [USC] 7506(c)) to ensure that federal funding and approval are given to highway and transit projects that are consistent with (and conform to) the air quality goals established by a SIP. The conformity requirement prohibits the U.S. Department of Transportation and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to SIP for attaining the NAAQS. Conformity means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (EPA 2018a).

Transportation conformity applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the CAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the CAA.

Note that this EIR does not address Regional Plan CAA conformity. Conformity documentation was performed separately by SANDAG and is contained within Appendix C of the proposed Plan.

Appendix C of the proposed Plan provides detailed information about the transportation conformity process for the proposed Plan.

Air Toxics

The 1990 Amendments to the CAA included a provision to address air toxics. Under Title III of the CAA, EPA establishes and enforces National Emission Standards for Hazardous Air Pollutants (NESHAPs), which are nationally uniform standards oriented toward controlling particular hazardous air pollutants (HAPs). Section 112(b) of the CAA identifies 189 "Air Toxics" (HAPs, since modified to 187 pollutants), directs EPA to identify sources of the HAPs, and establishes a 10-year time period for EPA to issue technology-based emissions standards for each source category. Emission standards have been developed for all of the stationary source categories under 40 Code of Federal Regulations (CFR) Part 63. Title III of the CAA provides for a second phase under which EPA is to assess residual risk after the implementation of the first phase of standards and impose new standards, when appropriate, to protect public health.

As mentioned in Section 4.31, in 2011, the EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the NATA. These significant contributors include 1,3-butadiene, acetaldehyde, acrolein, benzene, DPM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules (FHWA 2016).

Emission Standards

EPA has adopted regulations to limit emission from all sources of emissions. EPA regulates the emissions from mobile sources by setting standards for the specific pollutants being emitted. Emissions standards set limits on the amount of pollution a vehicle or engine can emit. Mobile source emission standards have been established for light-duty vehicles, trucks, and motorcycles; heavy duty trucks; and non-road engines, including aircraft, locomotives, marine vessels, and recreational engines and vehicles. The EPA has also established gasoline and diesel fuel standards (EPA 2017b).

A description of emission standards for sources analyzed in this EIR are included herein.

Emission Standards for Light-Duty Vehicles

Not including the SAFE Rule, which requires national CO_2 and fuel economy standards, the EPA has also established a series of increasingly strict emission standards for new light-duty vehicle engines. These standards were phased-in over three tiers:

- Tier 1 standards were published as a final rule on June 5, 1991, and phased-in progressively between 1994 and 1997.
- Tier 2 standards were adopted on December 21, 1999, with a phase-in implementation schedule from 2004 to 2009.
- Tier 3 standards were finalized on March 3, 2014, to be phased-in between 2017 and 2025.

Tier 1 standards applied to all new light-duty vehicles (LDV) of less than 8,500-pound gross vehicle weight rating (GVWR). The Tier 2 rule extended the applicability of the light-duty emission standards to medium-duty passenger vehicles (MDPV) with GVWR between 8,500 and 10,000 pounds. Tier 3 regulations additionally include emission standards for chassis-certified heavy-duty vehicles up to 14,000 pounds (Class 2b and Class 3). The successive tiers of emission regulations do not begin with a sharp cut-off date. Rather, each new tier of emission standards is phased-in over a number of years. During the phase-in period, manufacturers are required to certify an increasing percentage of their new vehicle fleet to the new standards, with the remaining vehicles still certified to the preceding tier of emission regulations (DieselNet 2020).

Emission Standards for Heavy-Duty Vehicles

The EPA has established a series of increasingly strict emission standards for new heavy-duty bus and truck engines. Emissions from heavy-duty trucks are managed by regulations and emission limits implemented at the federal, state, and local levels. In December 2000, EPA signed the Heavy-Duty Highway Rule, which reduces emissions from on-road, heavy-duty diesel trucks by establishing a series of increasingly strict emission standards for new engines. Manufacturers were required to produce new diesel vehicles that meet particulate matter and NO_X emission standards beginning with model year 2007, with the phase-in period being between 2007 and 2010. The phase-in was based on a percentage-of-sales basis: 50 percent from 2007 to 2009 and 100

percent in 2010. The requirements apply to engines installed in all vehicles with GVWR above 14,000 pounds, and to some engines installed in vehicles with GVWR between 8,500 and 14,000 pounds (EPA 2019c).

Additionally, the EPA and NHTSA established fuel efficiency and GHG standards for medium- and heavy-duty trucks under a joint rule. This rule—called the Phase 1 standards—requires fuel efficiency standards for engines in model years 2014 through 2018. In 2016, EPA and NHTSA adopted the Phase 2 standards, which requires fuel efficiency standards for engines in model years 2018 through 2027 (EPA 2016b). More information can be found within Section 4.8, *Greenhouse Gas Emissions*.

Emission Standards for Non-Road Diesel Engines

EPA established a series of increasingly strict emission standards for new non-road diesel engines. Tier 1 standards were phased in on newly manufactured equipment from 1996 through 2000 (year of manufacture), depending on the engine horsepower category. Tier 2 standards were phased in on newly manufactured equipment from 2001 through 2006. Tier 3 standards were phased in on newly manufactured equipment from 2006 through 2008. Tier 4 standards, which require advanced emission control technology to attain them, were phased in between 2008 and 2015. These emissions standards apply to all non-road (off-road) equipment used to construct elements of the Regional Plan (EPA 2004).

Emission Standards for Locomotives

The EPA established a series of increasingly strict emission standards for new or remanufactured locomotive engines (63 FR 18997-19084). Tier 0 standards, effective as of 2000, applied to engines manufactured or remanufactured from 1973 to 2001. Tier 1 standards applied to engines manufactured/remanufactured from 2002 to 2004. Tier 2 standards applied to engines manufactured/remanufactured after 2004.

In 2008, EPA strengthened the Tier 0 through 2 standards to apply to existing locomotives and introduced more stringent Tier 3 and 4 emission requirements (73 FR 88 25098-25352). Tier 3 standards, met by engine design methods, were phased in between 2011 and 2014. Tier 4 standards, which are expected to require exhaust gas after-treatment technologies, became effective starting in 2015. These standards apply to locomotives that are propelled by engines with total rated horsepower (hp) of 750 kilowatts (kW) (1,006 hp) or more (EPA 2016c). These emissions standards apply to all locomotive engines greater than 750 kW (1,006 hp) in the San Diego region. Engines smaller than 750 kW, including the 440-hp diesel-multiple unit (DMU) engines that power some Coaster and Sprinter activity, are regulated under the non-road standards discussed below. All freight (BNSF) and intra-regional passenger (Amtrak and Metrolink) trains are regulated under these standards.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

Mulford-Carrel Act

CARB was established when the California Legislature passed the Mulford-Carrell Act in 1967, which combined two bureaus within the Department of Health: the Bureau of Air Sanitation and the Motor Vehicle Pollution Control Board. CARB's mission is to promote and protect public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants, while recognizing and considering the effects on the state's economy. CARB also oversees the activities of 35 local and regional air pollution control districts. These districts regulate industrial pollution sources. They also issue permits, develop local plans to attain healthy air quality, and ensure that the industries in their area adhere to air quality mandates (CARB 2020c).

California Clean Air Act

In 1988, the state legislature adopted the CCAA, which established a statewide air pollution control program. CCAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the federal CAA, the CCAA does not set precise attainment deadlines. Instead, the CCAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards. CAAQS are generally more stringent than the NAAQS and incorporate additional standards for sulfate, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The CAAQS and NAAQS are listed together in Table 4.3-1.

CARB and local air districts bear responsibility for achieving California's air quality standards, which are to be achieved through district-level air quality management plans that would be incorporated into the SIP. In California, the EPA has delegated authority to prepare SIPs to CARB, which, in turn, has delegated that authority to individual air districts. CARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCMs).

Toxic Air Contaminant Identification and Control Act of 1983 and Air Toxics "Hot Spots" Information and Assessment Act of 1987

California regulates TACs primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 ("Hot Spots" Act). In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Act created California's program to reduce exposure to air toxics. The "Hot Spots" Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people who were exposed to a significant health risk, and facility plans to reduce these risks. The "Hot Spots" Act requires OEHHA to develop an approach for health risk assessments that can be used to determine the "likelihood of risks." The resultant guidance manual is titled *Air Toxics Hot-Spots Program Guidance Manual for the Preparation of Health Risk Assessments* (OEHHA 2015).

In September 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan was to reduce respirable DPM emissions and the associated health risk by 75 percent in 2010 and 85 percent in 2020. The plan identifies 14 measures that CARB has or may implement.

Senate Bill 535 and Assembly Bill 1532 of 2012

Senate Bill 535 requires the California Environmental Protection Agency (Cal/EPA) to identify disadvantaged communities based on geographic, socioeconomic, public health, and environmental hazard criteria. It also requires that the investment plan developed and submitted to the Legislature pursuant to AB 1532 allocate no less than 25 percent of available proceeds from the carbon auctions held under AB 32 to projects that will benefit these disadvantaged communities. At least 10 percent of the available funds from these auctions must be directly invested in such communities. Because CalEnviroScreen has been developed to identify areas

disproportionately affected by pollution and those areas whose populations are socioeconomically disadvantaged, it is well suited for the purposes described by Senate Bill 535 (OEHHA 2018).

Emission Standards

CARB established a series of increasingly strict emissions standards for new off-road diesel equipment (Small Off-Road Engines [13 California Code of Regulations (CCR) 2403-2407] and Tier 4 Off-Road Compression-Ignition Engine Regulations and Exhaust Emission Certification Test Fuel for Off-Road Spark-Ignition Engines, Equipment, and Vehicles [13 CCR 2421–2427]), on-road diesel trucks (California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles [13 CCR 1956]), and harbor craft (Low-Sulfur Fuel Requirement, Emission Limits, and Other Requirements for Commercial Harbor Craft [13 CCR 2299.6] and Airborne Toxic Control Measure for Commercial Harbor Craft [13 CCR 93118.5]).

CARB has also adopted emissions standards to reduce NO_X, DPM and other criteria pollutant emissions from in-use (i.e., existing) off-road diesel-fueled vehicles (Regulation for In-Use Off-Road Diesel-Fueled Fleets [13 CCR 2449]) and in-use on-road diesel-fueled vehicles (Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen, and Other Criteria Pollutants from In-Use Heavy-Duty Diesel-Fueled Vehicles [13 CCR 2025]).

Additionally, CARB established the Low Carbon Fuel Standard (LCFS), the Phase 1 Tractor-Trailer GHG regulation, and the Advanced Clean Cars Program (AB 1493 of 2002). While these standards, regulations, and programs predominately target GHG emissions, they also help reduce criteria air pollutant emissions. These standards, regulations, and programs are discussed in more detail in Chapter 4.8.

Executive Order N-79-20

Under EO N-79-20, 100 percent of in-state sales of new passenger cars and trucks are to be zero-emission by 2035; 100 percent of in-state sales of medium- and heavy-duty trucks and busses are to be zero-emission by 2045 for all operations, where feasible, and by 2035 for drayage trucks; and 100 percent of off-road vehicles and equipment sales are to be zero-emission by 2035 where feasible. EO N-79-20 directs CARB to partner with the Governor's Office of Business and Economic Development and other agencies to develop a Zero-Emissions Vehicle Market Development Strategy by January 31, 2021.

California Sustainable Freight Action Plan

The *Sustainable Freight Action Plan* (Sustainable Freight Action Plan or Action Plan) provides an integrated action plan that establishes clear targets to improve freight efficiency, transition to zero-emission technologies, and increase the competitiveness of California's freight system. The Action Plan was developed by several state agencies and is a recommendation document that integrates investments, policies, and programs across several state agencies to help realize a singular vision for California's freight transport system. This Action Plan provides a recommendation on a high-level vision and broad direction to the Governor to consider for state agencies to utilize when developing specific investments, policies, and programs related to the freight transport system that serves California's transportation, environmental, and economic interest. Furthermore, the CARB *2017 Scoping Plan* (2017 Scoping Plan) incorporates potential actions from the Action Plan that provide GHG emissions reduction benefits (CARB 2016b).

Climate Change Scoping Plan (2008 and 2017)

The first *CARB Scoping Plan* (Scoping Plan) was adopted in 2008 and updated in 2014 to meet 2020 targets, and laid out the state's strategy for achieving the 2020 reduction target to meet the state's 2020 reduction targets. It includes numerous recommended measures to reduce GHG emissions from a variety of activities and sources, including on-road transportation, electricity generation, and building energy use. In 2017, the Scoping Plan was updated to reflect the state's 2030 reduction target. The 2017 Scoping Plan integrates several existing CARB regulations and state strategies, including the Cap-and-Trade Program, Low Carbon Fuel Standard, SB 350 goals for renewable electricity procurement and doubling of Statewide energy efficiency savings in electricity and natural gas end uses, Mobile Source Strategy, Sustainable Freight Action Plan, and the Short-Lived Climate Pollutant (SLCP) Strategy. The 2017 Scoping Plan accelerates the state's focus on moving freight with zero and near-zero technologies, investing in renewables, creating walkable communities with expanded mass transit and other alternatives to traveling by car, continuing the cap-and-trade program, and managing natural lands to become carbon sinks. While the Scoping Plan itself is a plan to reduce GHG emissions, many of the measures and strategies implemented to reduce GHGs from across the economy also result in significant reductions in criteria air pollutants (CARB 2017a).

Executive Order N-19-19

Executive Order N-19-19 requires the Department of Finance to create a Climate Investment Framework and requires the State Transportation Agency to align transportation spending with achieving objectives of the Climate Change Scoping Plan, as well as to reduce VMT through strategic discretionary investments.

Air Quality and Land Use Handbook (2005) and Technical Advisory (2017)

CARB prepared a guidance document that includes recommendations for siting of sensitive receptors in proximity of emission sources. The *Air Quality and Land Use Handbook: A Community Health Perspective* (Land Use Handbook) provides guidance to the public and decision-makers to provide information on the siting "sensitive land uses" near specific sources of air pollution (CARB 2005); namely:

- High traffic freeways and roads
- Distribution centers
- Rail yards
- Ports
- Refineries
- Chrome plating facilities
- Dry cleaners
- Large gas dispensing facilities

The recommendations are provided in Table 4.3-5. The Land Use Handbook includes various limitations, and notes that the recommendations are advisory and that land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

Table 4.3-5
Recommendations on Siting New Sensitive Land Uses Such as Residences, Schools, Daycare Centers, Playgrounds, or Medical Facilities

Source Category	Advisory Recommendations
Freeways and High-Traffic Roads	• Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	• Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). • Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	• Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. • Within 1 mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	• Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or CARB on the status of pending analyses of health risks.
Refineries	• Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	• Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloro-ethylene	• Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. • Do not site new sensitive land uses in the same building with perc dry cleaning operations.
Gasoline Dispensing Facilities	• Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities.

Source: CARB 2005.

The State Planning Priorities emphasize infill development, as this pattern of development can help attain goals to promote equity, strengthen the economy, protect the environment, and promote public health and safety. However, many infill and compact development communities are located near freeways and other busy traffic corridors. This can present public health concerns regarding roadways near existing and future developments as this increases the possibility that at-risk populations/communities—such as children, pregnant women, the elderly, and those with serious health problems affected by air pollution—will be exposed to traffic emissions.

In response to this, CARB supplemented the Land Use Handbook in April 2017 to provide local planners and stakeholders with information regarding reducing exposure to traffic emissions near high-volume roadways in order to protect public health and promote equity and environmental justice. The *Technical Advisory: Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways* (Technical Advisory) includes various strategies to reduce pollution exposure through practices and technologies to reduce traffic emissions, increase dispersion of traffic pollution (or the dilution of pollution in the air), or remove pollution from the air (CARB 2017b).

The Technical Advisory includes seven effective strategies, divided into the following three general categories (CARB 2017b).

Strategies that Reduce Traffic Emissions

1. Speed reduction mechanisms including roundabouts
2. Traffic signal management
3. Speed limit reductions on high-speed roadways (>55 miles per hour [mph])

Strategies that Reduce the Concentration of Traffic Pollution

1. Urban design that promotes air flow and reduces the concentration of pollution along street corridors
2. Solid barriers such as sound walls
3. Vegetation that reduces the concentration of pollution

Strategies that Remove Pollution from Indoor Air

1. Indoor high efficiency filtration that removes pollution from the air

Public Exposure to Particulate Matter

Senate Bill (SB) 656 (Health and Safety Code Section 39614) of 2003 required CARB, in consultation with local air districts, to develop and adopt, by January 1, 2005, a list of the most readily available, feasible, and cost-effective control measures that could be employed by CARB and the air districts to reduce PM10 and PM2.5 (collectively referred to as PM). Measures adopted as part of SB 656 complement and support those required for federal PM2.5 attainment plans, as well as for state O_3 plans. This will ensure continuing focus on PM reduction and progress toward attaining California's more health protective standards. The list of air district control measures was adopted by CARB on November 18, 2004. CARB also developed a list of state PM control measures for mobile and stationary sources, including measures for adoption as part of CARB's Diesel Risk Reduction Plan.

Siting of Schools

State law (Public Resources Code Section 21151.8) prohibits the siting of a school within 500 feet of a freeway unless "the school district determines, through analysis based on appropriate air dispersion modeling, that the air quality at the proposed site is such that neither short- term nor long-term exposure poses significant health risks to pupils." The siting of schools is also regulated in the California Code of Regulations. According to 5 CCR Section 14010(e): "The site shall not be adjacent to a road or freeway that any site-related traffic and sound level studies have determined will have safety problems or sound levels which adversely affect the educational program."

Air Toxics Control Measures (Health and Safety Code Division 26)

Under Health and Safety Code, Division 26 (Air Resources), CARB is authorized to adopt regulations to protect public health and the environment through the reduction of TACs and other air pollutants with adverse health effects. As such, CARB has promulgated several mobile and stationary source airborne toxic control measures that identify specific measures designed to reduce emissions and therefore the exposure of individuals to TACs emitted from a variety of sources.

Specifically, CARB has adopted regulations governing diesel emissions from compression-ignition engines (17 CCR 93115 et seq.), portable engines (17 CCR 93116 et seq.), and locomotives and marine vessels (17 CCR 93117, 93118 et seq., and 93119; and 13 CCR 2299 et seq.), and emissions from offroad engines, including construction equipment, cargo handling equipment, and recreational vehicles (13 CCR 2400 et seq.).

Assembly Bill 617 of 2017

AB 617, signed into law in 2017, established the Community Air Protection Program (CAPP), which requires new community-focused and community-driven action to reduce air pollution and improve public health in communities that experience disproportionate burdens from exposure to air pollutants. Communities identified for monitoring include Portside Environmental Justice Neighborhoods of Barrio Logan as well as portions of National City, Sherman Heights, and Logan Heights. The SDAPCD is implementing the CAPP in San Diego County, which will eventually lead to additional pollution monitoring and additional requirements through the following: accelerated installation of pollution controls on industrial sources like oil refineries, cement plants, and glass manufacturers; expanded air quality monitoring within communities; increased penalties for violations of emissions control limits; and greater transparency and improved public access to air quality and emissions data through enhanced online web tools (SDAPCD 2018).

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

San Diego Air Pollution Control District

Local air pollution control districts have the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. SDAPCD is the local agency responsible for the administration and enforcement of air quality regulations in the San Diego region. SDAPCD' s primary roles include controlling air pollution from stationary sources, developing and monitoring the region's portion of the SIP, and developing rules for attaining NAAQS and CAAQS.

Regional Air Quality Strategy and State Implementation Plan

CARB and SDAPCD are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. As mentioned above, the most relevant air quality plan is the 2020 SIP, which addresses federal ozone non-attainment and represents the San Diego region's portion of the SIP. In addition, the *San Diego Regional Air Quality Strategy* (RAQS) is SDAPCD's most recent plan for attaining and maintaining state standards. The RAQS was initially adopted in 1991 and is updated on a triennial basis. The RAQS was updated in 1995, 1998, 2001, 2004, 2009, and most recently in 2016 (SDAPCD 2016). The RAQS does not currently address the state air quality standards for PM10 or PM2.5. Both the RAQS and SIP demonstrate the effectiveness of CARB measures (mainly for mobile sources) and SDAPCD's plans and control measures (mainly for stationary and area-wide sources) for attaining the O_3

NAAQS. The SIP is also updated on a triennial basis. For the 8-hour O_3 standard, the 2016 SIP outlines SDAPCD's portion of the SIP, and also outlines plans and control measures designed to attain and maintain the 8-hour O_3 NAAQS (2008 standard). The 2020 SIP outlines plans and control measures designed to attain and maintain the 8-hour O_3 NAAQS (2008 and 2015 standard). As of July 2021, the 2020 SIP is awaiting EPA approval and remains in draft form.

Chapter 5 of the RAQS includes three categories of emission control programs to reduce NO_X and VOCs emissions from mobile sources: Incentive Programs, Indirect Source Programs, and TCMs. TCMs are described in more detail in the AQ-1 impact analysis.

Incentive programs augment traditional control programs to further encourage technology development and provide cost-effective emission reductions in advance of regulatory requirements. The following Incentive Programs provide funding to reduce emissions of ozone precursors:

- Carl Moyer Memorial Air Quality Attainment Program
- Voucher Incentive Program (VIP)
- Proposition 1B Goods Movement Emission Reduction Program (GMERP)
- Vehicle Registration Fund Program (VRF)
- Lower Emission School Bus Replacement and Retrofit Program (LESB)
- American Recovery and Reinvestment Act Funding for the National Clean Diesel Funding Assistance Program (ARRA)
- Air Quality Power Generation Mitigation Fund
- Airport Taxicab Replacement Program (ended in 2015)
- Lawn Mower Exchange Program/Lawn and Garden Equipment Replacement Program (LGER)

SDAPCD's Indirect Source Program consists of ongoing outreach and assistance to local governments, land developers, citizen groups, and non-profit organizations to reduce vehicle trips and associated emissions through voluntary land use and street design improvements (i.e., "smart growth"). SDAPCD efforts include ongoing technical assistance to SANDAG on programs to encourage smart growth, and incorporate emission reductions goals and strategies into the 2011 and 2015 RTPs; technical assistance to both the City and County of San Diego in crafting their Climate Action Plans (CAPs); workshops/presentations and technical assistance for city planning staff, developers, and neighborhood groups to improve support alternative forms of transportation (walking, bicycling, transit); and developed smart growth and alternative transportation modes fact sheets.

Mobile Source Programs

SDAPCD operates two categories of emission control programs related to mobile sources—Financial Incentive Programs and an Indirect Source Program—in addition to coordinating with SANDAG to implement Transportation Control Measures.

Financial Incentive Programs augment traditional control programs to further encourage technology development and provide cost-effective emission reductions in advance of regulatory requirements. The incentive programs that have been implemented in the San Diego region during the last 6 years include Carl Moyer Memorial Air Quality Attainment Program, Voucher Incentive Program (VIP), Proposition 1B Goods

Movement Emission Reduction Program (GMERP), Vehicle Registration Fund Program (VRF), Lower Emission School Bus Replacement and Retrofit Program (LESB), American Recovery and Reinvestment Act Funding for the National Clean Diesel, Funding Assistance Program (ARRA), Air Quality Power Generation Mitigation Fund, Airport Taxicab Replacement Program; and Lawn Mower Exchange Program/Lawn and Garden Equipment Replacement Program (LGER).

The **Indirect Source Program** consists of ongoing outreach and assistance to local governments, land developers, citizen groups, and non-profit organizations to reduce vehicle trips and associated emissions through voluntary land use and street design improvements (i.e., "smart growth").

Recent SDAPCD efforts include the following, which are taken directly from Chapter 5 of the 2016 RAQS:

- Ongoing technical assistance to SANDAG on programs to encourage smart growth, including the following:
    - Adoption of the 2011 RTP and Sustainable Community Strategy to reduce greenhouse gases, which included smart growth incentives and funding for walking, bicycling, transit, and neighborhood traffic safety programs.
    - Creation of a regional Complete Streets Policy, as called for in the 2011 RTP.
    - Adoption of goals for the 2015 RTP update, including alternatives to single occupancy vehicles, air quality, greenhouse gas emission reductions, and public health.
- Technical assistance to both the City of San Diego and the County of San Diego in crafting their respective Climate Action Plans, to reflect greater reliance on transit and non-motorized transportation modes.
- Workshops/presentations and technical assistance for city planning staffs, traffic engineers, developers, merchant organizations, neighborhood groups, and others working to improve conditions for walking, bicycling, and transit.
- Developed fact sheets providing technical information on smart growth and alternative transportation modes, and posted them to the District's website.

Transportation Control Measures continue to be **i**mplemented for the six measures contained in previous RAQS revisions, consistent with program commitments made in the 2050 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), approved in 2015 and the 2014 Regional Transportation Improvement Program (RTIP), approved in 2014. The six RAQS Transportation Control Measures are: (1) Transit Improvements, (2) Vanpools, (3) High Occupancy Vehicle (HOV) Lanes, (4) Park-and-Ride Facilities, (5) Bicycle Facilities, and (6) Traffic Signal Improvements. Together, these measures have reduced motor vehicle travel and emissions.

Community Emissions Reduction Plan (2020/2021)

In December 2019, CARB selected the Portside Community[1] for a Community Emissions Reduction Program (CERP). The purpose of the CERP is to focus and accelerate new actions that go beyond existing state and regional programs to provide direct reductions in air pollution emissions and exposure within Portside communities. The CERP was presented in two phases. Phase I includes actions that have been fully developed

[1] The Portside Community includes the neighborhoods of Barrio Logan, Logan Heights, and Sherman Heights in the City of San Diego, and West National City within National City.

and supported by all jurisdictions or organizations that have an implementation role. The Phase I Draft CERP was released in September 2020 and was adopted in November 2020 (SDAPCD 2020b). Phase II includes the competition of a comprehensive CERP that fulfills the state's requirement, including a community profile and a suite of proposed goals and actions to improve air quality and reduce exposure to air pollution in the Portside Community. The Phase II Final CERP was adopted by SDAPCD in July 2021 (SDAPCD 2021a, SDAPCD 2021b).

The CERP is a plan for action to reduce air pollutant emissions and community exposure to those emissions in the Portside Community. The CERP includes 11 goals and 39 actions to achieve these emission reductions. Goals include reducing TAC emissions in the community, supporting electric freight truck infrastructure and upgrades, quantifying health risk from port and non-port activities, establishing health risk reduction goals, and implementing actions to achieve those goals. Actions include incentivizing building retrofits and emission reduction efforts, re-evaluating SDAPCD rules to increase regulation and increase rule enforcement, implementing various heavy duty freight truck strategies, implementing land use strategies (including a buffer between residential and industrial uses, the port, and freeways), and supporting various reduction efforts at the port (including equipment and electrification), along with outreach and community engagement.

Rules and Regulations

SDAPCD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. Land use and transportation projects under the proposed Plan may be subject to the following SDAPCD rules, and others.

- **Regulation 2, Rule 20.2—New Source Review Non-Major Stationary Sources:** establishes Air Quality Impact Analysis (AQIA) Trigger Levels, which set emission limits for non-major new or modified stationary sources.
- **Regulation 2, Rule 20.3—New Source Review Major Stationary Sources and Prevention of Significant Deterioration Stationary Sources**: establishes AQIA Trigger Levels, which set emission limits for major new or modified stationary sources or Prevention of Significant Deterioration stationary sources. Major sources are defined in Regulation 8 as sources that emit 100 tons per year of PM10, SO_X, CO, and lead; and 50 tons per year of NO_X and volatile organic compounds (VOC) in federal O3 nonattainment areas.
- **Rule 50—Visible Emissions**: establishes limits for the opacity of emissions within the SDAPCD. The proposed project is subject to Rule 50(d)(1) and (6) and should not exceed the visible emission limitation.
- **Rule 51—Nuisanc**e: prohibits emissions that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; endanger the comfort, repose, health, or safety of any such persons or the public; or cause injury or damage to business or property.
- **Rule 52—Particulate Matter**: establishes limits for the discharge of any particulate matter from nonstationary sources.
- **Rule 54—Dust and Fumes**: establishes limits for the amount of dust or fume discharged into the atmosphere in any 1 hour.
- **Rule 55—Fugitive Dust Control**: sets restrictions on visible fugitive dust from construction and demolition projects.
- **Rule 67—Architectural Coatings**: establishes limits to the VOC content for coatings applied within the SDAPCD.

- **Rule 67.7—Cutback and Emulsified Asphalts**: establishes general provisions and limits to the VOC content for asphalt materials applied within the SDAPCD.
- **Regulation 8, Rules 1200–1210**: establishes rules and procedures governing new, relocated, or modified emission units that may increase emissions of one or more TAC. While the proposed Plan is not y subject to the requirements of these rules, the risk assessment guidelines and procedures published as part of this regulation are used in the health risk assessment herein. Specifically, SDAPCD Rule 1210 implements the public notification and risk reduction requirements of AB 2588. The rule requires stationary sources with a risk above 10 in a million cancer risk and/or a hazard index above 1.0 for non-cancer effects to notify the public of potential risks due to exposure from emissions. The rule also requires facilities with a risk above 100 in a million to implement risk reduction measures. SDAPCD is currently in the process of revising Rule 1210 to require facilities with a risk above 10 in a million to implement risk reduction (instead of 100 in a million currently) measures. The updated rule is expected to be adopted in Fall 2021 (SDAPCD 2021c).

4.3.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines ("Appendix G") provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the Appendix G checklist questions. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, the unique nature of the proposed Plan's air quality impacts, and the unique characteristics of the proposed Plan.

Checklist questions for air quality are provided in Section III of Appendix G. To better focus the potential impacts associated with the proposed Plan, the Appendix G questions have been combined and modified. Specifically, air quality criterion (c) has been expanded to three items herein to better focus the potential impacts of similar criterion ("substantial pollutant concentrations") that require different modeling and result in varying degrees of health outcomes. Specifically, substantial pollutant concentrations of PM10 and PM2.5 are included in Impact AQ-4, substantial pollutant concentrations of TACs are included in Impact AQ-5, and substantial pollutant concentrations of CO hotspots are included in Impact AQ-6. The other air quality checklist items (a, b, and d) have been revised to focus the impact determination on actual impacts associated with the proposed Plan.

Therefore, implementation of the proposed Plan would have a significant air quality impact if it would:

AQ-1	Conflict with or obstruct implementation of the Regional Air Quality Strategy and/or State Implementation Plan
AQ-2	Result in a cumulatively considerable net increase in nonattainment or attainment criteria pollutants, including VOC, NO_X, PM10, PM2.5, and SO_X
AQ-3	Result in construction-related emissions above regional mass emission thresholds
AQ-4	Expose sensitive receptors to substantial PM10 and PM2.5 concentrations
AQ-5	Expose sensitive receptors to substantial TAC concentrations
AQ-6	Expose sensitive receptors to carbon monoxide hot spots
AQ-7	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people

4.3.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

AQ-1 CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE REGIONAL AIR QUALITY STRATEGY AND/OR STATE IMPLEMENTATION PLAN

ANALYSIS METHODOLOGY

The applicable air quality attainment plans include the 2020 SIP, the 2016 SIP, and the 2016 RAQS. While the SDAB is designated as a nonattainment area for the state PM10 and PM2.5 standards, the CCAA does not require preparation of attainment plans for these pollutants, and no such plans have been prepared.

Regional Growth and Land Use Change

The analysis evaluates whether forecasted regional growth and land use change under the proposed Plan would conflict with or obstruct implementation of programs and rules and regulations adopted as part of the RAQS and SIP. The growth forecast used in the RAQS and O_3 SIPs is compared to forecasted growth under the proposed Plan. In addition, the analysis describes whether forecasted regional growth and land use change would conflict with or obstruct implementation of any of the applicable control measures contained within the 2020 SIP, 2016 SIP, or the 2016 RAQS.

Attachments D and E of the 2020 SIP includes a list of control measures adopted by CARB between 1985 and 2019 to reduce emissions of O_3 precursors.

Transportation Network Improvements and Programs

The SANDAG transportation conformity analysis provided in Appendix D to this EIR is used to determine whether implementation of planned transportation network improvements and programs would conflict with or obstruct implementation of both the 2016 SIP and 2020 SIP. Modeled motor vehicle emissions resulting from implementation of the proposed Plan are compared to the emissions budgets established in the SIP. In this case, the conformity analysis was conducted for both the 2016 SIP, which was adopted by EPA in October 2016, and the 2020 SIP, which was under EPA review at the time of Draft EIR preparation.

The emissions for regional conformity were calculated using CARB's EMFAC2017 model and take into account SAFE Vehicles Rule adjustment factors provided by CARB.[2] The analysis also compares the planned transportation network improvements and programs with the TCMs identified in the RAQS and both the 2016 and 2020 Ozone SIPs.

[2] The emissions from the regional conformity and Impact AQ-1 EIR analysis conservatively applied the SAFE Vehicles Rule adjustment factors, which increase AQ and GHG emissions in line with the increased fuel consumption. Thus, if the SAFE Rule were to be rescinded, Impact AQ-1 analyzes the worst case emission scenario.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

The RAQS is based on the Series 12 Regional Growth Forecast and the 2011 RTP, which forecast growth in the region (relative to 2008) of 400,000 people by the year 2020, 900,000 people by the year 2035, and 1.3 million people by the year 2050. Total population was projected to be 4.4 million in 2050.

The 2020 SIP is based on a number of sources, including EMFAC2017. Growth in EMFAC2017 modeling is based on Department of Finance (DOF) forecasting and SANDAG assumptions in Series 13. The Series 13 Regional Growth Forecast and the 2015 Regional Plan forecast growth in the region (relative to 2012) of approximately 300,000 people by the year 2020, 700,000 people by the year 2035, and 925,000 people by the year 2050. Total population was projected to be 4.1 million in 2050 (SANDAG 2015).

The proposed Plan is based on the Series 14 Regional Growth Forecast, which aligns with DOF forecasting from January 2020. Growth projections included within the proposed Plan, relative to 2016, show a growth of approximately 160,000 people by the year 2025, 310,000 people by the year 2035, and 435,000 people by the year 2050. Total population is now projected to be 3.7 million in 2050, which represents an 8 percent reduction from the estimate assumed in the RAQS and a 15 percent reduction from the estimate assumed in the SIP.

Figure 4.3-1 summarizes the growth projections assumed in Series 12 (assumed in the RAQS), Series 13 (assumed in the SIP), and Series 14 (assumed in the proposed Plan). As shown, the projections for the proposed Plan are lower than assumed in the prior growth forecasts in 2025. Thus, because the proposed Plan's growth forecast is below that assumed in the RAQS, the proposed Plan's growth forecast does not conflict with the growth forecast in the RAQS.

Chapter 4 of the RAQS includes a re-evaluation of control measures for stationary sources that have been adopted to reduce emissions of VOCs and NO_X within the region. The RAQS control measures that apply to stationary sources include the following:

- Control of Solvent Cleaning (SDAPCD Rule 66.1)
- Control of Architectural Coatings (SDAPCD Rule 67.0.1
- Control of Wood Coatings (SDAPCD Rule 67.11)
- Polyester Resin Operations (SDAPCD Rule 67.12.1)
- Automotive Refinishing (SDAPCD Rule 67.20.1)
- Stationary Combustion Turbines (SDAPCD Rule 69.3.1)
- Small Boilers, Process Heaters, and Steam Generators Between 600,000 and 2 Million BTU/hr3 (SDAPCD Rule 69.2.1)

[3] BTU = British thermal units; hr = hour

- Medium Boilers, Process Heaters, and Steam Generators Between 2 Million and 5 Million BTU/hr (SDAPCD Rule 69.2.2)
- Control of Stationary Combustion Turbines (SDAPCD Rule 69.3.1)
- Control of Residential Water Heaters Smaller than 75,000 BTU/hr (SDAPCD Rule 69.5.1)
- Stationary Reciprocating Internal Combustion Engines Best Available Retrofit Technology (SDAPCD Rule 69.4.1)

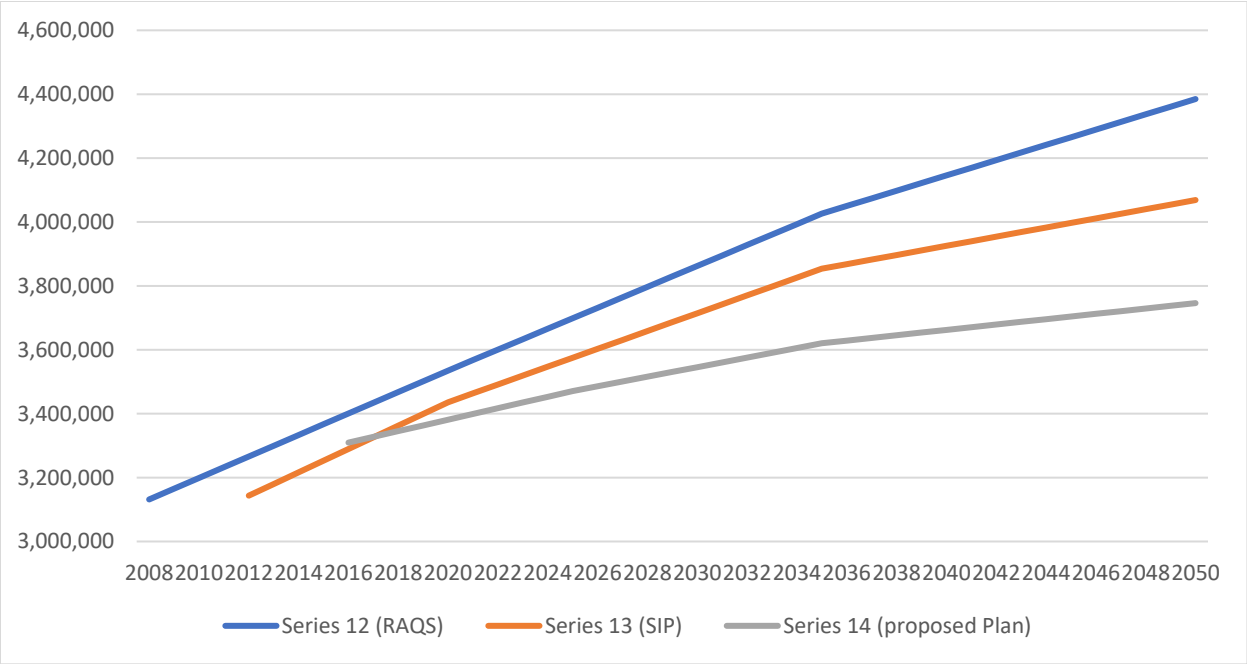
Moreover, Attachment B of the 2020 SIP includes a list of rules that are being added or supplemented as part of the submittal to EPA:

- Transfer of Gasoline into Stationary Underground Storage Tanks (SDAPCD Rule 61.3.1)
- Major Source Landfill Flare Control Measure (SDAPCD Rule to be determined)
- Transfer of Volatile Organic Compounds into Mobile Transport Tanks ((SDAPCD Rule 61.2)
- Cold Solvent Cleaning and Stripping Operations (SDAPCD Rule 67.6.1)

SDAPCD rules are implemented primarily through SDAPCD permitting processes that are specific to each facility or operation. These measures were adopted as part of the RAQS and SIP to reduce emissions that contribute to ozone formation. SDAPCD and CARB have adopted various strategies within the RAQS and SIP as enforceable requirements, and regional growth and land use changes associated with the proposed Plan are subject to the applicable regulations.

As noted, forecasted growth for each forecast year is less than that assumed in the RAQS and SIP. L land use changes in 2025 under the proposed Plan would be subject to and implement the above regulations, and therefore would not conflict with or obstruct implementation of the RAQS or the SIP. Therefore, regional growth and land use change would not conflict with or obstruct implementation of the applicable air quality plans in 2025. This impact is less than significant.

Figure 4.3-1. Comparison of Regional Population Projections



Source: SANDAG 2015, SDAPCD 2016, SANDAG 2021a.

Transportation Network Improvements and Programs

Modeled emissions from the transportation conformity analysis are summarized in Table 4.3-6. As shown, ozone precursors ROG and NO_X in 2025 are less than the conformity budget emissions for both ROG and NO_X in both the 2016 SIP and 2020 SIP. Thus, the transportation network improvements and programs of the proposed Plan would not generate emissions greater than anticipated by relevant federal and state air quality attainment plans.

Table 4.3-6
Air Quality Conformity Emissions (tons per day)

SIP Year	Year	ROG		NO_X	
		SIP Budget	Proposed Plan	SIP Budget	Proposed Plan
2016 SIP	2023	23	13.5	42	17.2
	2025	23	12.5	42	16.0
	2030	23	10.0	42	13.1
	2035	23	8.7	42	12.4
	2040	23	7.4	42	11.7
	2050	23	6.8	42	12.0
2020 SIP	2023	13.6	13.5	19.3	17.2
	2025	12.6	12.1	18.0	15.5
	2026	12.1	11.4	17.3	14.7
	2029	11.0	10.2	15.9	13.4
	2032	10.0	9.3	15.1	12.6
	2035	10.0	8.6	15.1	12.3
	2040	10.0	7.4	15.1	11.7
	2050	10.0	6.8	15.1	12.0

Source: SANDAG 2021b
Note: Conformity years for the 2016 SIP (2023, 2030, 2040, 2050) and 2020 SIP (2023, 2026, 2029, 2032, 2040, 2050) do not align perfectly with the analysis years for the proposed Plan. SIP budgets and emission estimates for the missing years (2025 and 2035) were estimated based on linearly interpolating between the previous and next conformity year. Interpolated numbers are shown in *italics*. Interpolated numbers for the missing years for the proposed Plan are different in the 2016 and 2020 SIP comparisons because the conformity years differ, and the emissions under proposed Plan conditions do not necessarily increase linearly. For example, linearly interpolating between the 2023 and 2030 numbers in the 2016 SIP emissions results in a different value than interpolating between the 2023 and 2026 numbers in the 2020 SIP, even though the 2023 and 2040 estimates are the same under both SIPs.
Note: From the Draft EIR to the Final EIR, SANDAG revised its ABM2+ model to reflect minor modifications to the transportation network improvements as well as minor modeling corrections. Those modeling changes result in lower VMT for baseline (2016) and Plan years (2035 and 2050), and slightly increased VMT for Plan year 2025, which would reduce emissions for baseline (2016) and Plan years (2035 and 2050), and slightly increase emissions for Plan year 2025. No update to the air quality modeling is required because the air quality model results are conservative for 2035 and 2050, and would show only very minor increases for 2025; these changes would not change any conclusions in this EIR.

There are four federally approved TCMs in the RAQS that must be implemented in the San Diego region, which the SIP refers to as *transportation tactics*. These TCMs include ridesharing, transit improvements, traffic flow improvements, and bicycle facilities and programs. The TCMs have been fully implemented. Ridesharing, transit, bicycling, and traffic flow improvements continue to be funded, although the level of implementation established in the SIP has been surpassed (Appendix D).

There are six TCMs in the RAQS, which are commitments made in the 2050 Regional Transportation Plan (2011 EIR): (1) Transit Improvements, (2) Vanpools, (3) High Occupancy Vehicle (HOV) Lanes, (4) Park-and-Ride Facilities, (5) Bicycle Facilities, and (6) Traffic Signal Improvements. A discussion demonstrating the proposed Plan's consistency with these six TCMs is provided below (SANDAG 2011).

Transit Improvement and Expansion Program. The RAQS identifies replacing diesel-fueled buses with Compressed Natural Gas buses, increasing bus travel, and increasing rail transit services. The entire

Metropolitan Transit System (MTS) fleet of 40- and 60-foot buses uses Renewable Compressed Natural Gas, and MTS recently adopted a plan to transition the entire fleet to zero-emissions vehicles by 2040. MTS currently has eight electric buses in service and plans to fast track the purchase of 17 additional zero emission buses by 2022 (MTS 2021).

The goal of the Transit Leap Big Move is a complete network of fast, convenient, and reliable transit services that connect people from where they live to where they want to go. Transit leap improvements include Commuter Rail, Next Gen Rapid Service, Mobility Hub investments, and Light Rail Transit (LRT). Commuter Rail includes new and upgraded rail service with high-speed trains that are fast and convenient with grade-separated infrastructure. Next Gen Rapid Service is reliable Rapid bus service operating in priority lanes and making use of better signal technology. Mobility Hub investments include land acquisition and amenities for the San Ysidro Mobility Hub and Central Mobility Hub. LRT includes improvements to existing light rail services and new tram services. Ferry service operating in San Diego Bay is also included.

Through 2025, major transit improvements include commuter rail (Commuter Rail 398) improvements between Oceanside and Downtown San Diego, including a new Gaslamp station; the Rapid 10 line from La Mesa to Ocean Beach via Mid-City, Hillcrest, and Old Town; the Rapid 292 line for Pacific Beach and Kearny Mesa; and the Rapid 450 between Oceanside and Escondido via Palomar Airport Road. New zero-emission buses and initiatives to promote more environmentally sustainable freight vehicles will also be a priority. The proposed Plan would provide an additional 39,000 miles of transit service and increase transit mode share approximately one percent while reducing vehicular mode share and vehicle trip lengths approximately 3 percent over 2016 levels.

Vanpools. SANDAG would continue to operate its Regional Vanpool Program, providing increased access to carpooling. The SANDAG Vanpool program is offered by iCommute and displaced approximately 93 million vehicle miles traveled in Fiscal Year (FY) 2019.

High Occupancy Vehicle (HOV) Lanes. Managed Lanes (MLs), such as those along the Interstate (I-) 15 corridor, offer priority access to people using transit, carpooling, or vanpooling along with emergency vehicles and low-emission vehicles with appropriate decals. MLs are expanded to all urban and interregional highway corridors in the region. Existing infrastructure is maximized by repurposing shoulders or existing travel lanes to create MLs where shoulders, high-occupancy vehicle travel lanes, or general-purpose travel lanes exist today. By 2025, the only additional ML proposed is along I-5 between Manchester Avenue and Vandegrift Boulevard.

Park-and-Ride Facilities. The proposed Plan supports the use of carpooling and transit park-and-ride facilities to provide access to alternative modes of transportation and is consistent with this TCM. SANDAG iCommute maintains a park-and-ride webpage. There are no specific park-and-ride lots proposed.

Bicycle Facilities. Projects in the proposed Plan would improve or expand bicycle and pedestrian interconnections between neighborhoods and communities that are currently separated by major transportation corridors. Additionally, projects that support the proposed Plan's Active Transportation improvements reflect the adopted Regional Bike Network and include both on- and off-street improvements to create a safe and comfortable space for people to walk, bike, and ride micromobility options. By 2025, major bike projects include the Central Avenue Bikeway, North Park/Mid-City Bikeways, Bayshore Bikeway, Pershing Bikeway, Uptown Bikeways, and Mobility Hub connections. SANDAG also has funding allotted for e-bike incentives and to implement a Commuter Services and Bike Program.

Traffic Signal Improvements. The proposed Plan would encourage funding of traffic signal improvements to reduce congestion in the region. There are some projects to implement signal improvements, such as in National City along Plaza Boulevard. Traffic signal improvements do not reduce VMT but they do reduce intersection delay.

2025 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to conflict with or obstruction of implementation of the applicable air quality plans because regional growth and land use change would be consistent with the SIP growth forecasts, and applicable rules, regulations, and programs adopted as part of the plans by the SDAPCD and CARB. Implementation of the transportation network improvements and programs would also be consistent with the applicable air quality plans because the emissions are less than the conformity budget emissions budget for ROG and NO_X. Also, the transportation network improvements and programs are consistent with the TCMs contained within the SIP and the RAQS. Therefore, this impact (AQ-1) is less than significant in 2025.

2035

Regional Growth and Land Use Change

Figure 4.3-1 summarizes the growth projections assumed in Series 12 (assumed in the RAQS), Series 13 (assumed in the SIP), and Series 14 (assumed for the proposed Plan). As shown, the projections for the proposed Plan are lower than assumed in the prior growth forecasts in 2035.

The RAQS and SIP were adopted to reduce emissions that contribute to ozone formation. SDAPCD and CARB have adopted various strategies within the RAQS and SIP as enforceable requirements, and regional growth and land use changes associated with the proposed Plan are subject to the applicable regulations.

As noted, forecasted growth for each forecast year is less than that assumed in the RAQS and SIP. Forecasted regional growth and land use change in 2035 under the proposed Plan would be subject to and implement the regulations described in the 2025 analysis above, and therefore would not conflict with or obstruct implementation of the RAQS or the SIP. Therefore, regional growth and land use change would not conflict with or obstruct of implementation of the applicable air quality plans. This impact is less than significant.

Transportation Network Improvements and Programs

Modeled emissions from the transportation conformity analysis are summarized in Table 4.3-6. As shown, ozone precursors ROG and NO_X in 2035 are less than the conformity budget emissions for both ROG and NO_X. Thus, the transportation network improvements and programs of the proposed Plan would not generate emissions greater than forecast by relevant federal and state air quality attainment plans.

The same RAQS TCMs discussed above under 2025 are applicable to the 2035 time horizon. A discussion demonstrating the proposed Plan's consistency with the six TCMs by 2035 is provided below.

Transit Improvement and Expansion Program. By 2035, major transit improvements include expanded commuter rail services (Commuter Rail 582) improvements between Sorrento Mesa and National City, ferry services between Downtown San Diego and North Island (Coronado), Double/Third tracking and other improvements along the Trolley's Blue Line, improvements along the Trolley's Orange Line, the San Ysidro Mobility Hub, along with the Central Mobility Hub, and associated improvements, including the Airport

Connection Automated People Mover. Moreover, there are numerous Rapid Bus projects, serving all major communities and corridors. The proposed Plan would provide an additional 150,000 miles of transit service and increase transit mode share approximately 3 percent while reducing vehicular mode share 7 percent and vehicle trip lengths approximately 3 percent over 2016 levels.

Vanpools. SANDAG would continue to operate its Regional Vanpool Program, providing increased access to carpooling. The SANDAG Vanpool program is offered by iCommute and displaced approximately 93 million vehicle miles traveled in FY2019.

High Occupancy Vehicle (HOV) Lanes. MLs, such as those along the I-15 corridor, offer priority access to people using transit, carpooling, or vanpooling along with emergency vehicles and low-emission vehicles with appropriate decals. MLs are expanded to all urban and interregional highway corridors in our region. Existing infrastructure is maximized by repurposing shoulders or existing travel lanes to create MLs where shoulders, high-occupancy vehicle travel lanes, or general-purpose travel lanes exist today. By 2035, there are numerous ML projects proposed along I-5, I-15, I-805, State Route (SR) 163, SR 905, and SR 125.

Park-and-Ride Facilities. The proposed Plan supports the use of carpooling and transit park-and-ride facilities to provide access to alternative modes of transportation and is consistent with this TCM. SANDAG iCommute maintains a park-and-ride webpage. There are no specific park-and-ride lots proposed by 2035.

Bicycle Facilities. By 2035, major bike projects include improvements to the Bayshore Bikeway, Uptown Bikeway, North Park/Mid-City Bikeway, the Central Mobility Bikeway, the Imperial Bikeway to J Street Cycle Track Connector, the I-15 Bikeway, the Mira Mesa Neighborhood Bikeway, and the San Diego River Bikeway and Connections. SANDAG also has funding allotted for e-bike incentives and to implement a Commuter Services and Bike Program.

Traffic Signal Improvements. By 2035, there are some projects to implement signal improvements, including Harbor Drive 2.0, which will, among other things, provide signal priority for freight trucks traveling to and from Tenth Avenue Marine Terminal, as well signal improvements at the Palm Avenue/I-805 Interchange.

2035 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to conflict with or obstruction of implementation of the applicable air quality plans because regional growth and land use change would be consistent with the SIP growth forecasts, and applicable rules, regulations, and programs adopted as part of the plans by the SDAPCD and CARB. Implementation of the transportation network improvements and programs would also be consistent with the applicable air quality plans because the emissions are less than the conformity budget emissions budget for ROG and NO_X. Also, the transportation network improvements and programs are consistent with the TCMs contained within the SIP and the RAQS. Therefore, this impact (AQ-1) is less than significant in 2035.

2050

Regional Growth and Land Use Change

Figure 4.3-1 summarizes the growth projections assumed in Series 12 (assumed in the RAQS), Series 13 (assumed in the SIP), and Series 14 (assumed here for the proposed Plan). As shown, the projections for the proposed Plan are lower than assumed in the prior growth forecasts in 2050.

The RAQS and SIP were adopted to reduce emissions that contribute to ozone formation. SDAPCD and CARB have adopted various strategies within the RAQS and SIP as enforceable requirements, and regional growth and land use changes associated with the proposed Plan are subject to the applicable regulations.

As noted, forecasted growth for each forecast year is less than that assumed in the RAQS and SIP. Forecasted regional growth and land use change in 2050 under the proposed Plan would be subject to and implement the regulations described in the 2025 analysis above, and therefore would not conflict with or obstruct implementation of the RAQS or the SIP. Therefore, regional growth and land use change would not conflict with or obstruct of implementation of the applicable air quality plans. This impact is less than significant.

Transportation Network Improvements and Programs

Modeled emissions from the transportation conformity analysis are summarized in Table 4.3-6. As shown, ozone precursors ROG and NO_X in 2050 are less than the conformity budget emissions for both ROG and NO_X. Thus, the transportation network improvements and programs of the proposed Plan would not generate emissions greater than anticipated by relevant federal and state air quality attainment plans.

The same RAQS TCMs discussed above under 2025 are applicable to the 2050 time horizon. A discussion demonstrating the proposed Plan's consistency with the six TCMs by 2050 is provided below.

Transit Improvement and Expansion Program. By 2050, major transit improvements include expanded commuter rail services (Commuter Rail 582) improvements between the Central Mobility Hub, National City, and the U.S. Border; a Tram connecting downtown with Logan Heights, Golden Hill, and other communities; and a Sprinter. All told, by 2050, the proposed Plan would increase commuter rail and light rail (Trolley) service up to 22 hours per day, while connecting major residential areas with employment centers, commercial areas, and other popular destinations; operate numerous Rapid Bus lines up to 20 hours per day; and improve local bus and provide microtransit services to complete the Transit Leap. By 2050, the proposed Plan could result in 13 percent of commuters using transit (up from 3 percent today) and a substantial decline in commuters driving alone to work (from 80 percent today to 62 percent in 2050). The proposed Plan would provide an additional 263,000 miles of transit service and increase transit mode share approximately 3.7 percent while reducing vehicular mode share 10 percent and vehicle trip lengths approximately 2 percent over 2016 levels.

Vanpools. SANDAG would continue to operate its Regional Vanpool Program, providing increased access to carpooling. The SANDAG Vanpool program is offered by iCommute and displaced approximately 93 million vehicle miles traveled in FY2019.

High Occupancy Vehicle (HOV) Lanes. By 2050, there are numerous ML projects proposed along every freeway in the region, including those listed for 2035, along with SR 54 and SR 11.

Park-and-Ride Facilities. The proposed Plan supports the use of carpooling and transit park-and-ride facilities to provide access to alternative modes of transportation and is consistent with this TCM. SANDAG iCommute maintains a park-and-ride webpage.

Bicycle Facilities. Projects in the proposed Plan would improve or expand bicycle and pedestrian interconnections between neighborhoods and communities that are currently separated by major transportation corridors. Additionally, projects that support the proposed Plan's Active Transportation improvements reflect the adopted Regional Bike Network and include both on- and off-street improvements to create a safe and comfortable space for people to walk, bike, and ride micromobility options.

By 2050, major bike projects include the SR 56 Bikeway, Mira Mesa Corridor, Harbor Drive Multimodal Corridor Improvements, SR 125 Corridor – Sweetwater Bikeway, La Mesa Regional Bike Network Connector, San Diego River Bikeway, I-15 Bikeway, SR 52 Bikeway, and Mid-County Bikeway.

Traffic Signal Improvements. The proposed Plan would encourage funding of traffic signal improvements to reduce congestion in the region.

2050 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to conflict with or obstruction of implementation of the applicable air quality plans because regional growth and land use change would be consistent with the SIP growth forecasts, and applicable rules, regulations, and programs adopted as part of the plans by the SDAPCD and CARB. Implementation of the transportation network improvements and programs would also be consistent with the applicable air quality plans because the emissions are less than the conformity budget emissions budget for ROG and NO_X. Also, the transportation network improvements and programs are consistent with the TCMs contained within the SIP and the RAQS. Therefore, this impact (AQ-1) is less than significant in 2050.

Exacerbation of Climate Change Effects

Although there will be climate change impacts in the San Diego region that could conflict with or obstruct implementation of the regional air quality plans as described in Section 4.3.1, the proposed Plan would not exacerbate climate change effects on the air quality plans if it remains in compliance with existing and evolving regulatory requirements, assuming these requirements incorporate consideration of future climate change.

AQ-2 RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE IN NONATTAINMENT OR ATTAINMENT CRITERIA POLLUTANTS, INCLUDING VOC, NO_X, CO, PM10, AND PM2.5, AND SO_X

ANALYSIS METHODOLOGY

This analysis focuses on the criteria pollutants for which the region is classified as nonattainment: O_3 (NAAQS and CAAQS) and PM2.5 and PM10 (CAAQS). Emissions are also projected for criteria pollutants for which the region is attainment: CO and SOx.

Future operational emissions of ozone precursors (VOC and NO_X), PM10, PM2.5, CO, and SOx associated with implementation of the proposed Plan are identified. Future emissions under the proposed Plan are then compared to 2016 levels. Pollutant emissions that show no change or decrease under the proposed Plan would not contribute to a cumulative increase in emissions and therefore are not addressed further in the analysis. Where operational pollutant emissions increase under the proposed Plan, the analysis consider whether the increase is cumulatively considerable. Any incremental increase associated with the proposed Plan is considered cumulatively considerable. Cumulative emissions from all sources in the region are reported from the CARB emissions inventory for 2016, 2025, and 2035. 2050 emissions are extrapolated from 2035 from the CARB emissions inventory, as explained in Appendix D. Please note that construction emissions are addressed separately under Impact AQ-3.

On-road emissions were estimated based on emission factors from CARB's EMFAC2017 model based on the average fleet mix operating in San Diego County for each analysis year, fugitive road dust PM10 and PM2.5 emission factors using CARB methodology, and activity data from SANDAG's activity-based model for each

analysis year,[4] Freight rail emissions were estimated based on CARB's freight emissions model in EMFAC for each analysis year. Passenger rail emissions were estimated based on rail activity for existing (e.g., Amtrak, Sprinter, and Coaster) and proposed new rail lines as well as fleet locomotive fleet turnover for each analysis year, as provided by SANDAG staff (SANDAG pers comm), along with EPA emission factors for locomotives.

Note that the on-road emission estimates differ from the emissions estimates for the transportation conformity (Table 4.3-6) due to methodological differences. The primary difference here is that on-road emissions estimates are estimated by roadway link using the actual speeds provided in SANDAG activity-based model. The VMT and emission factor model are the same, so differences in emissions are due primarily to speed differences.

Note that the focus of this analysis is on those emission sources that would be directly changed by the proposed Plan. The proposed Plan does not cause additional regional growth; instead, the proposed Plan calls for concentrating future growth within designated Mobility Hubs or Smart Growth Opportunity Areas. This focus on densification would not change the amount of future development in the region. Other sources of emissions associated with land use development — such as stationary sources (electric utilities, cogeneration, fuel combustion for food and agricultural processing, fuel combustion for service and commercial uses, sewage treatment, landfills, and dry cleaning) and area sources (consumer products use, architectural coatings, pesticides and fertilizers, residential fuel combustion, and cooking) — are therefore not included in the emissions estimates.

Health Impacts

As discussed in Section 4.3.1, all criteria pollutants that would be generated by the proposed project are associated with some form of health risk (e.g., asthma, lower respiratory problems). Criteria pollutants can be classified as either regional or localized pollutants. Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. Ozone is considered a regional criteria pollutant, whereas CO, NO_2, SO_X, and Pb are localized pollutants. PM can be both a local and a regional pollutant, depending on its composition.

Regional Project-Generated Criteria Pollutants (Ozone Precursors, Regional SO_X, and Regional PM)

Adverse health effects induced by regional criteria pollutant emissions generated by the proposed Plan (ozone precursors, SO_X and PM) are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). For these reasons, ozone precursors (ROG and NO_X) contribute to the formation of ground-borne ozone on a regional scale Emissions of ROG and NO_X generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of particulate and SO_X pollution may be transported over long distances or formed through atmospheric reactions. As such, the magnitude and locations of specific health effects from exposure to increased ozone, SO_X, or regional PM concentrations are the product of emissions generated by numerous sources throughout a region, as opposed to a single individual project. Moreover, exposure to regional air pollution does not guarantee that an individual will experience an

[4] The status of the SAFE Vehicles Rule is highly uncertain given the recent Executive Order aimed at its repeal and replacement with more aggressive electric vehicle standards. Even if the rule were maintained, the impact on emissions is negligible.

adverse health effect—as discussed above, there are large individual differences in the intensity of symptomatic responses to air pollutant. However, other variables, including the overall health of individuals and other underlying medical conditions, which cannot be known, strongly influence individual health consequences.

Nonetheless, emissions increases by the proposed Plan, were they to occur, could increase photochemical reactions and the formation of tropospheric ozone, SO_X, and secondary PM, which, at certain concentrations, could lead to increased incidence of specific health consequences, such as various respiratory and cardiovascular ailments, which for the reasons stated above cannot meaningfully be quantified. As discussed previously, air districts develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates there are known safe concentrations of criteria pollutants. Thus, NAAQS and CAAQS are health-based standards.

Localized Project-Generated Criteria Pollutants and Air Toxics (CO, NO_2, SO_X, and Pb)

Localized pollutants generated by a project are deposited and potentially affect populations near the emissions source. Because these pollutants dissipate with distance, emissions from individual projects can result in direct health impacts on adjacent sensitive receptors. Localized pollutants include localized PM and TACs.

The localized PM analysis is provided in Impact AQ-4. In AQ-4, if the proposed Plan would contribute to an existing violation or create a new violation, it would also contribute to these adverse health effects. Health impacts of TACs are analyzed separately in Impact AQ-5.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Forecasted regional growth and land use change and transportation network improvements and programs by 2025 would generate air pollutant emissions directly and indirectly during operation of development and the transportation network.

As shown in Table 4.3-7, emissions would decrease from 2016 to 2025 under implementation of the proposed Plan for all emissions as follows:

- ROG reduced by 4.1 tons per day, or 63 percent
- NO_X reduced by 23.3 tons per day, or 66 percent
- CO reduced by 78.8 tons per day, or 54 percent
- PM10 reduced by 0.5 ton per day, or 3 percent
- PM2.5 reduced by 0.5 ton per day, or 13 percent
- SO_X reduced by 0.1 ton per day, or 15 percent

Note that in terms of activity, VMT, freight rail, and passenger rail activity is projected to increase between 2016 and 2025. Reductions in emissions across the board are due primarily to federal and state regulations that reduce emissions from vehicles and locomotives over time. Moreover, while passenger rail activity

increases, the rail lines, such as Coaster and Amtrak, are replacing existing older locomotives with modern, Tier 4 engines by 2025. Thus, while activity and fuel consumption increase, emissions are reduced, because Tier 4 engines emit fewer emissions per gallon of fuel consumed that the current locomotive fleet.

For on-road sources, the average vehicle fleet in 2025 is assumed to be substantially cleaner than the existing fleet. Therefore, while total VMT would increase ~~less than 0.6~~1.1 percent), emissions of all pollutants decrease, because newer vehicles emit less emissions on a per mile basis. It is worth noting that the decrease in PM10 and PM2.5 is less than other pollutants because PM10 and PM2.5 emissions from onroad sources are dominated (comprising 95 percent of PM10 and 83 percent of PM2.5) by paved road dust as well as brake and tire wear in 2025, and emission rates for paved road dust as well as brake and tire wear do not follow the same downward trend as vehicle exhaust. Therefore, PM10 and PM2.5 emissions trend down by 2025, but only slightly.

As shown, emissions from the proposed Plan are reduced for each criteria pollutant, including nonattainment pollutants. There would be no adverse health effects associated with these emissions decreases. Because the proposed Plan would result in reduction in ozone.

Table 4.3-7
Proposed Plan Emission Estimates Prior to Mitigation

Emission Category	Emissions (tons per day)					
	ROG	NO_X	CO	PM10	PM2.5	SO_X
2016						
On-Road Sources	6.4	33.0	145.1	13.5	3.6	0.4
Freight Rail	<0.0	0.8	0.2	<0.0	<0.0	<0.0
Passenger Rail	0.1	1.4	<0.0	0.1	<0.0	<0.0
Total 2016	6.5	35.3	145.3	13.6	3.7	0.4
2025						
On-Road Sources	2.4	11.2	67.1	13.1	3.2	0.3
Freight Rail	<0.0	0.5	0.2	<0.0	<0.0	<0.0
Passenger Rail	<0.0	0.3	<0.0	<0.0	<0.0	0.1
Total 2025	2.4	12.0	67.4	13.1	3.2	0.3
Net Change From 2016	-4.1	-23.3	-78.0	-0.5	-0.5	-0.04
2035						
On-Road Sources	1.8	8.0	53.4	13.3	3.2	0.2
Freight Rail	<0.0	0.3	0.3	<0.0	<0.0	<0.0
Passenger Rail	<0.0	0.6	<0.0	<0.0	<0.0	0.1
Total 2035	1.8	8.8	53.7	13.4	3.2	0.4
Net Change From 2016	-4.7	-26.5	-91.7	-0.2	-0.5	<-0.0
2050						
On-Road Sources	1.6	7.5	51.1	13.8	3.3	0.2
Freight Rail	<0.0	0.3	0.3	<0.0	<0.0	<0.0
Passenger Rail	0.1	1.4	<0.0	<0.0	<0.0	0.3
Total 2050	1.7	9.2	51.4	13.8	3.4	0.5
Net Change From 2016	-4.8	-26.1	-93.9	+0.2	-0.3	+0.1

Source: Refer to Appendix D for modeling assumptions, inputs, and results.

Note: From the Draft EIR to the Final EIR, SANDAG revised its ABM2+ model to reflect minor modifications to the transportation network improvements as well as minor modeling corrections. Those modeling changes result in lower VMT for baseline (2016) and Plan years (2025, 2035, and 2050), which would reduce emissions for baseline (2016) and Plan years (2025, 2035, and 2050). No update to the air quality modeling is required because the air quality model results are conservative and these changes would not change any conclusions in this EIR.

2025 Conclusion

Implementation of the proposed Plan would not result in a cumulatively considerable net increase in any nonattainment or attainment criteria pollutant, as emissions would be lower than baseline (2016) conditions. Therefore, this impact is less than significant in 2025.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

As shown in Table 4.3-7, emissions would decrease from 2016 to 2035 under implementation of the proposed Plan for all emissions as follows:

- ROG reduced by 4.7 tons per day, or 73 percent
- NO_X reduced by 26.5 tons per day, or 75 percent
- CO reduced by 91.7 tons per day, or 63 percent
- PM10 reduced by 0.2 ton per day, or 2 percent
- PM2.5 reduced by 0.5 ton per day, or 12 percent
- SO_X reduced by 0.04 ton per day, or 9 percent

Note that in terms of activity, VMT, freight rail, and passenger rail activity is projected to increase between 2016 and 2035. Reductions in emissions across the board are due primarily to federal and state regulations that reduce emissions from vehicles and locomotives over time. Moreover, while passenger rail activity increases, all passenger rail lines (both current and new) are assumed to be operating completely with modern, Tier 4 engines by 2035. Thus, while activity and fuel consumption increase, emissions are reduced, because Tier 4 engines emit fewer emissions per gallon of fuel consumed that the current locomotive fleet.

For on-road sources, the average vehicle fleet in 2035 is assumed to be substantially cleaner than the existing fleet. Therefore, while total VMT would increase (2.2~~3~~ percent), emissions of all pollutants decrease, because newer vehicles emit less emissions on a per mile basis. It is worth noting that the decrease in PM10 and PM2.5 is less than other pollutants because PM10 and PM2.5 emissions from onroad sources are dominated (comprising 98 percent of PM10 and 94 percent of PM2.5) by paved road dust as well as brake and tire wear in 2035, and emission rates for paved road dust as well as brake and tire wear do not follow the same downward trend as vehicle exhaust. Therefore, PM10 and PM2.5 emissions trend down by 2035, but only slightly.

As shown, emissions from the proposed Plan are reduced for each criteria pollutant. including nonattainment pollutants. There would be no adverse health effects associated with these emissions decreases.

2035 Conclusion

Implementation of the proposed Plan would not result in a cumulatively considerable net increase in any nonattainment or attainment criteria pollutant, as emissions would be lower than baseline (2016) conditions. Therefore, this impact is less than significant in 2035.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

As shown in Table 4.3-7, emissions would decrease from 2016 to 2050 under implementation of the proposed Plan as follows:

- ROG reduced by 4.8 tons per day, or 74 percent
- NO_X reduced by 26.1 tons per day, or 74 percent
- CO reduced by 93.9 tons per day, or 65 percent
- PM2.5 reduced by 0.3 ton per day, or 9 percent

As shown in Table 4.3-7, emissions would increase from 2016 to 2050 under implementation of the proposed Plan as follows:

- PM10 increased by 0.2 ton per day, or 1 percent
- SO_X increased by 0.1 ton per day, or 32 percent

Note that in terms of activity, VMT, freight rail, and passenger rail activity is projected to increase between 2016 and 2050. Reductions in emissions for ROG, NO_X, CO, and PM2.5 are due primarily to federal and state regulations that reduce emissions from vehicles and locomotives over time. Moreover, while passenger rail activity increases, all passenger rail lines (both current and new) are assumed to be operating completely with modern, Tier 4 engines by 2050. Thus, while activity and fuel consumption increase, emissions from passenger rail are reduced because Tier 4 engines emit fewer emissions per gallon of fuel consumed that the current locomotive fleet. Note that in 2050, emissions of CO and SO_X from passenger rail are expected to increase because there are no Tier 4 reductions assumed for CO and SO_X; thus, CO and SO_X emissions from rail increase along with the increase in activity and fuel consumption.

For on-road sources, the average vehicle fleet in 2050 is assumed to be substantially cleaner than the existing fleet. Therefore, while total VMT is would increase (~~6.7~~5.4 percent), emissions of all pollutants decrease except PM10 and SO_X, because newer vehicles emit less emissions on a per mile basis. The PM10 emissions increase is due to fact that PM10 emissions from road dust as well as brake and tire wear are not assumed to decrease on a per-mile basis over time, and these emissions are tied to increased VMT. This incremental increase in PM10 emissions is a significant impact.

The SO_X emissions increase is due to fact that SO_X emissions from passenger rail are assumed to increase along with the increase in fuel consumption. The proposed Plan includes various mobility improvements that aim to increase commuter transit ridership from 3 percent under current conditions to 13 percent by 2050. The proposed Plan includes four new commuter rail lines by 2050, and facilitates increased activity along existing (e.g., Amtrak, Coaster, and Sprinter) commuter rail lines. Total transit trips (including both electric light rail [trolley] and commuter rail [diesel]) would increase from 631 daily trips under existing conditions, to over 2,900 daily trips by 2050. This results in an increase from passenger rail diesel fuel combustion on the average day from 7,500 gallons per day under existing conditions to almost 62,000 gallons per day in 2050, due solely

to the increase in activity and assuming all new passenger rail activity and rail lines will be powered by Tier 4 diesel engines.

While the EIR modeling conservatively assumes all new commuter rail will be diesel, future commuter rail, particularly those lines that begin service after 2035, are actually likely to be powered by zero emission or near-zero emission technologies, such as electric, hybrid, and other technologies and fuels, as those technologies improve, costs decrease, and existing diesel locomotives reach the end of their useful life. As agencies and the State look beyond Tier 4 emissions standards, zero emissions rail is set to dictate the next cycle of rail vehicle design. Zero-emissions is supported by the Governor through Executive Order N-79-20 and is likely to become standard practice in the coming years.

As shown, emissions from the proposed Plan are reduced for VOC, NO_X, CO, and PM2.5 but increase for PM10 and SO_X, representing a significant impact The increase in these emissions can contribute to short- and long-term human health effects described in Section 4.3-1.

SO_X is a precursor to fine PM formation in the form of sulfates, such as ammonium sulfate, and short-term exposure can aggravate the respiratory system, making breathing difficult. Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease.

Broadly, PM contains microscopic solids or liquid droplets that are so small that they can be inhaled and cause serious health problems. However, PM2.5 is more of a concern than PM10. CARB states that PM2.5 is more likely to travel into and deposit on the surface of the deeper parts of the lung, while the EPA states that PM2.5 poses the greatest risk to health (CARB 2021, EPA 2021). As shown in Table 4.3-7 and as discussed above, while PM10 emissions increase slightly (1 percent), PM2.5 emissions decrease (9 percent).

2050 Conclusion

Implementation of the proposed Plan would result in a cumulatively considerable net increase in PM10 and SO_X emissions in 2050. Therefore, this impact (AQ-1) is significant in 2050.

Exacerbation of Climate Change Effects

The proposed Plan is expected to exacerbate climate change effects on increases in some criteria pollutants. Climate change may result in increased wildfire frequency and intensity, which can increase emissions of particulate matter, carbon monoxide, nitrogen oxide, and other volatile organic compounds. Precipitation during dry seasons may also decrease under climate change, reducing regional ability to fight wildfires and reduce this source of particulate matter (Reidmiller et al. 2018). As mentioned in Section 4.3.1, climate change could increase vehicle idling due to traffic disruption from flooding and wildfire that may block routes, thus increasing the amount of particulate matter and SO_X coming from vehicles. Since the proposed Plan may also result in increased PM10 and SO_X emissions, the air quality impacts from the proposed Plan may exacerbate climate change impacts.

The proposed Plan would not cause a considerable net increase in other nonattainment criteria pollutants, such as ROG, NO_X, CO, and PM2.5. Therefore, although there will be climate change impacts in the San Diego region that could increase emissions of these pollutants as described in Section 4.3.1, the proposed Plan would not exacerbate climate change-caused increases of these emissions.

MITIGATION MEASURES

AQ-2 RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE IN NONATTAINMENT AND ATTAINMENT CRITERIA POLLUTANTS, INCLUDING VOC, NO_X, PM10, PM2.5, AND SO_X

2050

Implement mitigation measures **GHG-5a (Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans), GHG-5b (Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure), GHG-5d (Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide),** and **GHG-5f (Implement Measures to Reduce GHG Emissions from Development Projects)** , as discussed under Impact GHG-5 in Section 4.8. In addition, implement mitigation measure **TRA-2** (**Achieve Further VMT Reductions for Transportation and Development Projects**), as discussed under Impact TRA-2 in Section 4.16, *Transportation*.

AQ-2a. Secure Incentive Funding. SANDAG, in partnership with SDAPCD and the Port of San Diego, and member cities, will seek to secure incentive funding to reduce mobile SO_X and PM emissions from mobile exhaust, and entrained PM sources such as tire wear, brake wear, and re-entrained road dust. Such incentive funding or programs are:

- Voucher Incentive Program (VIP)
- Vehicle Registration Fund Program (VRF)
- Lower Emission School Bus Replacement and Retrofit Program (LESB)
- American Recovery and Reinvestment Act funding for the National Clean Diesel Funding Assistance Program (ARRA)

2050

AQ-2b. Zero Emission Trains. SANDAG shall only purchase zero emission trains on any new rail lines or train equipment after 2035. Zero emission trains can include fully electric, battery-electric, hydrogen fuel cell, or any technology that results in no tailpipe emissions. New rail lines construction after 2035 shall be powered completely by zero emission trains.

SIGNIFICANCE AFTER MITIGATION

Mitigation measures GHG-5a, GHG-5b, GHG-5d, and GHG-5f would reduce PM10 and PM2.5 emissions from tire wear, break wear, and vehicle exhaust, as discussed in Section 4.8. In addition, mitigation measure TRA-2 would reduce criteria pollutants through project-level VMT reduction measures, as discussed in Section 4.16. Measures to reduce VMT or vehicle exhaust (e.g., EVs) in these mitigation measures would reduce PM10 and SOx emissions and associated concentrations.

Mitigation AQ-2a would reduce PM10 and SO_X emissions from onroad sources by securing funding to implement ways to reduce all emissions, including PM10 and SO_X emissions from mobile sources.

Mitigation AQ-2b would reduce exhaust PM10 and SOx emissions from commuter trains by replacing diesel fuel combustion with zero-emission energy sources. The SO_X impact in 2050 is due primarily to fuel combustion from commuter trains, since SO_X emission scale linearly with fuel consumption, regardless of the engine tier. This mitigation measure would be implemented in all new rail lines after 2035, and would reduce diesel fuel consumption by 46 percent in 2050 relative to unmitigated conditions. This would result in a similar 46 percent in SO_X from passenger rail and a 25 percent in SO_X overall, as shown in Table 4.3-8. After mitigation, SO_X emissions would be reduced to below 2016 conditions.

Table 4.3-8
Proposed Plan Emission Estimates After Mitigation for 2050

Emission Category	Emissions (tons per day)					
	ROG	NO_X	CO	PM10	PM2.5	SO_X
2050 Mitigated						
On-Road Sources[1]	1.63	7.49	51.08	13.77	3.32	0.23
Freight Rail[1]	0.01	0.28	0.30	0.00	0.00	0.00
Passenger Rail[2]	0.03	0.77	0.01	0.02	0.01	0.15
Total 2050	1.67	8.54	51.39	13.79	3.34	0.39
Net Change From 2016[3]	-4.87	-26.74	-93.93	+0.19	-0.36	-0.005

[1] Onroad and Freight Rail emissions are unchanged from the unmitigated emission estimates shown in Table 4.3-7.
[2] Passenger Rail emissions assume a 46 percent decrease in fuel consumption in 2035.
[3] 2016 emissions are shown in Table 4.3-7.
Note: From the Draft EIR to the Final EIR, SANDAG revised its ABM2+ model to reflect minor modifications to the transportation network improvements as well as minor modeling corrections. Those modeling changes result in lower VMT for baseline (2016) and Plan years (2025, 2035, and 2050), which would reduce emissions for baseline (2016) and Plan years (2025, 2035, and 2050). No update to the air quality modeling is required because the air quality model results are conservative and these changes would not change any conclusions in this EIR.

Mitigation has been identified for PM10 (AQ-2a) and SO_X (AQ-2b). Mitigation measure AQ-2b would reduce SO_X emissions so that they would be less than cumulatively considerable, and therefore less than significant. However, for mitigation measure AQ-2a and other PM-reducing mitigation measures, it cannot be guaranteed that PM10 emissions would be reduced to where they would be less than cumulatively considerable. Therefore, impacts related to cumulatively considerable net increases in air pollutant emissions would remain significant and unavoidable.

AQ-3 RESULT IN CONSTRUCTION-RELATED EMISSIONS ABOVE MASS EMISSION THRESHOLDS

ANALYSIS METHODOLOGY

Projects that could be constructed as part of the proposed Plan would generate construction-related criteria pollutant and TAC emissions from mobile and stationary construction equipment exhaust, employee and haul truck vehicle exhaust, dust from land clearing, and application of asphalt and architectural coatings. However, the specific size, location, and construction techniques and scheduling that would be utilized for each individual development project occurring from implementation of the proposed Plan are not currently known. With a horizon year of 2050, development of the various land use changes and transportation network improvements would occur over an extended period and would depend on factors such as local economic conditions, market demand, and other financing considerations.

Although SDAPCD has not developed specific thresholds of significance to evaluate construction and operational impacts within CEQA documents, SDAPCD's Regulation II, Rules 20.2 and 20.3 (new source review for non-major and major stationary sources, respectively), outline AQIA Trigger Levels for criteria pollutants for new or modified sources. Based on SDAPCD's AQIA Trigger Levels, as well as EPA rulemaking and CEQA thresholds adopted by the South Coast Air Quality Management District (SCAQMD), the County of San Diego has established screening-level thresholds (SLTs) to assist lead agencies in determining the significance of project-level air quality impacts within the county. These hourly, daily, and annual thresholds are shown in Table 5 of the *County's Guidelines for Determining Significance – Air Quality* (County of San Diego 2007). The County's guidelines typically inform environmental review for development projects in the County, and are used here to help determine impact significance.

Pursuant to the County Guidelines, cconstruction impacts predominantly result from two sources: fugitive dust from surface disturbance activities; and exhaust emissions resulting from the use of construction equipment (including, but not-limited to: graders, dozers, back hoes, haul trucks, stationary electricity generators, and construction worker vehicles). One of the pollutants of concern during construction is particulate matter, since PM10 is emitted as windblown (fugitive) dust during surface disturbance, and as exhaust of diesel-fired construction equipment (particularly as PM2.5). Other emissions of concern include architectural coating products off-gassing (VOCs), and other sources of mobile source (on-road and off-road) combustion (NO_X, SO_X, CO, PM10, PM2.5, and VOCs) associated with the project.

At this program level of analysis, it is not possible to quantify the amount of construction emissions from implementation of the proposed Plan or their health impacts. To the extent that construction emissions would violate ambient air quality standards, they could lead to the health consequences discussed in Section 4.3.1 However, the overall impact on local and regional air quality from any one project or all projects combined would be primarily dependent on the quantity, age, and fuel type of the equipment and the duration of their operation at the construction site or in the region. It should be noted that construction emissions, although not quantified, would add to the concentration impacts in AQ-4 and AQ-5.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Various transportation and development projects would be constructed by 2025. Construction of land use changes and transportation network improvements would result in emissions of air pollutants, including ROG, NO_X, CO, SO_X, PM10, and PM2.5. Emissions associated with a typical construction project are generally short-term and limited to the project construction phase. Construction emission sources include construction equipment, employee commuting, vendor and material deliveries, haul trucks, demolition, grading and other ground disturbing activities, application of paint and other coatings, and paving.

The proposed Plan includes numerous transportation projects by 2025 as part of the SCS, 5 Big Moves, transportation network improvements, and supporting policies and programs. The proposed Plan would also accommodate land use growth to accommodate 97,661 new households, 161,338 new residents, and 115,328 new jobs by 2025. While construction of each individual project is temporary and limited in nature, emissions from individual construction projects have the potential to exceed daily thresholds.

EPA and CARB have adopted rules and regulations establishing criteria pollutant and hazardous emissions limits for diesel-powered on-road vehicles and off-road equipment. EPA and CARB regulations will continue to reduce emissions from internal combustion trucks and equipment over the life of the proposed Plan. Further, SDAPCD has rules in place to limit emissions from construction activities, such as Rule 55 (requires measures to minimize fugitive dust during construction and demolition activities) and Rule 51 (restricts the discharge of air contaminants or other material which cause harm, injury, or nuisance). Additionally, construction activities are accounted for in SDAPCD's RAQS and SIP inventories. As demonstrated in the 2020 SIP, and discussed below, total regional emissions of VOC and NO_X from construction sources would generally decline through at least 2032.

Despite regulatory actions from EPA, CARB, and SDAPCD, these regulations cannot assure that all projects consistent with the proposed Plan would not result in emissions exceeding thresholds. Construction could result in substantial construction-related emissions on a daily or annual basis, exceeding County thresholds.

2025 Conclusion

The proposed Plan could result in a substantial increase in construction-related emissions exceeding County thresholds as the various land use changes and transportation network improvements are constructed; therefore, this impact (AQ-2) would be significant in 2025.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

The proposed Plan includes numerous transportation projects by 2035 as part of the SCS, 5 Big Moves, transportation network improvements, and supporting policies and programs. The proposed Plan would also accommodate land use growth to accommodate 219,311 new households, 310,838 new residents, and 275,056 new jobs by 2035. While construction of each individual project is temporary and limited in nature, emissions from individual construction projects have the potential to exceed daily thresholds.

EPA and CARB have adopted rules and regulations establishing criteria pollutant and hazardous emissions limits for diesel-powered on-road vehicles and off-road equipment. EPA and CARB regulations will continue to reduce emissions from internal combustion trucks and equipment over the life of the proposed Plan. Further, SDAPCD has rules in place to limit emissions from construction activities, such as Rule 55 (requires measures to minimize fugitive dust during construction and demolition activities) and Rule 51 (restricts the discharge of air contaminants or other material which cause harm, injury, or nuisance). Additionally, construction activities are accounted for in SDAPCD's RAQS and SIP inventories. As demonstrated in the 2020 SIP, total regional emissions of VOC and NO_X from construction sources would generally decline through at least 2032.

Despite regulatory actions from EPA, CARB, and SDAPCD, these regulations cannot assure that all projects consistent with the proposed Plan would not result in emissions below thresholds. Construction could result in substantial construction-related emissions exceeding County thresholds on a daily or annual basis.

2035 Conclusion

The proposed Plan could result in a substantial increase in construction-related emissions exceeding County thresholds as the various land use changes and transportation network improvements are constructed, and this impact would be significant.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

The proposed Plan includes numerous transportation projects by 2050 as part of the SCS, 5 Big Moves, transportation network improvements, and supporting policies and programs. The proposed Plan would also accommodate land use growth to accommodate 280,744 new households, 436,563 new residents, and 439,899 new jobs by 2050. While construction of each individual project is temporary and limited in nature, emissions from individual construction projects have the potential to exceed daily thresholds.

EPA and CARB have adopted rules and regulations establishing criteria pollutant and hazardous emissions limits for diesel-powered on-road vehicles and off-road equipment. EPA and CARB regulations will continue to reduce emissions from internal combustion trucks and equipment over the life of the proposed Plan. Further, SDAPCD has rules in place to limit emissions from construction activities, such as Rule 55 (requires measures to minimize fugitive dust during construction and demolition activities) and Rule 51 (restricts the discharge of air contaminants or other material which cause harm, injury, or nuisance). Additionally, construction activities are accounted for in SDAPCD's RAQS and SIP inventories. As demonstrated in the 2020 SIP, total regional emissions of VOC and NO_X from construction sources would generally decline through 2050.

Despite regulatory actions from EPA, CARB, and SDAPCD, these regulations cannot assure that all projects consistent with the proposed Plan would not result in emissions below thresholds. Construction could result in substantial construction-related emissions exceeding County thresholds on a daily or annual basis.

2050 Conclusion

The proposed Plan could result in a substantial increase in construction-related emissions exceeding County thresholds as the various land use changes and transportation network improvements are constructed, and this impact would be significant.

Exacerbation of Climate Change Effects

Climate change would not increase construction emissions, so the proposed Plan's increases in construction emissions would not exacerbate a climate change effect.

MITIGATION MEASURES

AQ-3 RESULT IN CONSTRUCTION-RELATED EMISSIONS ABOVE MASS EMISSION THRESHOLDS

2025, 2035, and 2050

Implement mitigation measures **GHG-5e (Implement Measures to Reduce GHG Emissions from Transportation Projects)** and **GHG-5f (Implement Measures to Reduce GHG Emissions from Development Projects)**, as discussed under Impact GHG-5 in Section 4.8.

AQ-3a Implement Construction Best Management Practices for Fugitive Dust. During planning, design, and project-level CEQA review of transportation network improvements and programs or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, evaluate the potential for localized particulate (PM10 and PM2.5) impacts

that result in exceedances of the CAAQS or NAAQS using applicable procedures and guidelines for such analyses (for example, SDAPCD and EPA air dispersion modeling guidance). If impacts are significant, during project-level construction, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, implement best management practices (BMPs) to reduce impacts, including but not limited to, the following:

- Use fugitive dust control measures to reduce generation from exposed surfaces during construction, as specified in SDAPCD Rule 55 (SDAPCD 2009). SDAPCD Rule 55 includes various requirements, including preventing visible dust beyond the property line for more than 3 minutes in any 60-minute period, applying dust suppressants, removing all track-out/carry-out dust at the conclusion of each work day Compliance with these regulatory requirements is a performance standard for mitigation of construction activity particulate emissions. . Reductions in fugitive dust emissions range from 40 to 80 percent for minimizing track-out to 90 percent for use of tarps or cargo covering when transporting material (SCAQMD 2007, WRAP 2006).
- Use additional fugitive dust control measures such as watering or application of dust suppressants to reduce the generation of fugitive dust at active construction sites. Reductions in fugitive dust emissions range from 10 to 74 percent for watering of unpaved surfaces to 84 percent for use of dust suppressants (WRAP 2006).
- Implement controls on haul trucks to reduce emissions from haul trucks transporting soil, sand, or other loose material off site. Reductions in fugitive dust emissions are estimated at 91 percent for use of tarps or cargo covering when transporting material (SCAQMD 2007).
- Remove visible mud or dirt track-out onto adjacent public roads. Reductions in fugitive dust emissions range from 40 to 80 percent for minimizing track-out (WRAP 2006).
- Limit vehicle speeds on unpaved surfaces during construction to 15 mph. Reductions in fugitive dust emissions from unpaved surfaces are estimated at 57 percent (WRAP 2006).
- Suspend excavation, grading, and/or demolition activities when average wind speeds exceed 20 mph. Reductions in fugitive dust emissions are estimated at 98 percent (WRAP 2006).
- Plant vegetative ground cover (e.g., fast-germinating native grass seed) in disturbed areas. Reductions in fugitive dust emissions from wind erosion are estimated at 90 percent (WRAP 2006).
- Wash all trucks and equipment, including their tires, prior to leaving the construction site. No quantitative estimate of the effectiveness of this measure is available.
- Implement other site-specific fugitive dust control measures as warranted for individual construction projects for the transportation network and/or land use projects.

AQ-3b Reduce Diesel Emissions During Construction From Off-Road Equipment. For impacts on air quality from construction exhaust s, during planning, design, and project-level CEQA review of transportation network improvements and programs or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, implement BMPs to reduce criteria pollutant and TAC impacts from off-road equipment, including, but not limited to, the following:

- Ensure off-road equipment greater than 25 horsepower (hp) that will be operating for more than 20 hours during construction meets the following requirements:

  - Ensure engines are zero emissions or equipped with an CARB Level 3 Verified Diesel Emissions Control Strategy, if available for the equipment being used, unless the equipment meets EPA Tier 4 emission standards.
  - If project-specific analysis demonstrates that the above measure would not adequately reduce impacts (as determined by the project-level lead agency),provide engines that meet or exceed either EPA Tier 4 off-road standards.
- Monitor idling time of diesel-powered construction equipment and limit to no more than 2 minutes.
- Maintain and properly tune construction equipment in accordance with the manufacturers' specifications.
- Prohibit portable diesel generators and use grid power when it is available. Use propane or natural gas generators when grid power electricity is not feasible.
- Use late model engines.
- Use low emission diesel products.
- Use alternative fuels in construction equipment.
- Use engine retrofit technology to control emissions from off-road equipment.

AQ-3c Reduce Diesel Emissions During Construction From On-Road Vehicles. For impacts on air quality from construction exhaust as a result of transportation network improvements and programs or development projects, during project-level CEQA review and construction, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, implement BMPs to reduce criteria pollutant and TAC impacts from on-road vehicles, including but not limited to:

- Monitor idling time of diesel-powered trucks, and limit to no more than 2 minutes.
- Provide clear signage for construction workers at all access points.
- Maintain and properly tune vehicles in accordance with the manufacturers' specifications.
- Ensure that construction activity deliveries are scheduled during off-peak hours (e.g., 10 a.m. to 3 p.m.) and are coordinated to consolidate truck trips. When the movement of construction materials and/or equipment impacts traffic flow, provide temporary traffic control (e.g., flag person) to improve traffic flow.
- Use late model engines (2010 or new model years).
- Use low emission diesel products in on-road vehicles.
- Use zero emission or near-zero emission technologies or alternative fuels in on-road vehicles.
- Use engine retrofit technology on on-road vehicles.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Mitigation measure AQ-3a would reduce the impacts associated with fugitive dust (fugitive PM10 and PM2.5 emissions) during construction, as well as the impacts associated with exhaust emissions from construction equipment. Mitigation measure AQ-3b would reduce the impacts associated with exhaust emissions from construction equipment. Mitigation measure AQ-3c would reduce diesel emissions during construction from on-road vehicles.

Additionally, mitigation measures GHG-5e and GHG-5f would reduce construction emissions through use of energy and fuel-efficient vehicle and equipment. (see Section 4.8*)*. Although mitigation would reduce impacts, there is no guarantee that all projects' impacts would be reduced to below a level of significance; thus, impacts would be significant and unavoidable.

AQ-4 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL PM10 AND PM2.5 CONCENTRATIONS

ANALYSIS METHODOLOGY

If the proposed Plan would violate the PM10 or PM2.5 air quality standards or substantially contribute to an existing violation, then it would be considered to expose sensitive receptors to substantial PM10 and PM2.5 concentrations, which in turn would contribute to adverse health effects. Under the CAAQS, the SDAB is designated as a state nonattainment area for PM10 and PM2.5 (as well as ozone). The San Diego region is in attainment of the NAAQS for PM10 and PM2.5 (as well as other criteria pollutants). This analysis is based on operational emissions associated with forecasted regional growth and land use change and planned transportation network improvements and programs. The assumptions for operational emissions calculations for regional growth and land use change and transportation network improvements and programs are provided in Appendix D of this EIR.

The analysis to evaluate whether the proposed Plan would violate any PM10 or PM2.5 air quality standard or contribute substantially to an existing projected air quality violation involves two main steps.

1. Existing baseline mass emissions and future mass emissions in 2025, 2035, and 2050 under the proposed Plan were estimated for onroad, freight rail, and commuter rail sources. Methods and assumptions for projecting mass emissions are presented in Appendix D of this EIR. Results are presented in Impact AQ-2.
2. Based on these emission estimates, a detailed localized analysis was performed for each analysis year to determine whether the operational emissions of the proposed Plan would violate an air quality standard or contribute substantially to an existing violation.

Note that from the Draft EIR to the Final EIR, SANDAG revised its ABM2+ model to reflect minor modifications to the transportation network improvements as well as minor modeling corrections. Those modeling changes result in lower VMT for baseline (2016) and Plan years (2025, 2035, and 2050), which would reduce emissions for baseline (2016) and Plan years (2025, 2035, and 2050). No update to the air quality modeling is required because the air quality model results are conservative and these changes would not change any conclusions in this EIR.

Methods and results for the PM10 and PM2.5 modeling are presented in detail in Appendix D of this EIR. Because San Diego County is designated as a state nonattainment area for both PM10 and PM2.5, localized modeling is performed for both PM10 and PM2.5.

Given the spatial limitations in the chosen dispersion model (AERMOD), the populated areas of the county were divided into six modeling subdomains. Each modeling subdomain was assigned a representative meteorological station and air quality monitoring station. Background monitoring data at each subdomain was evaluated to determine the appropriate design values for modeling. While San Diego as a whole is currently in nonattainment for both the PM2.5 CAAQS and the PM10 CAAQS, not all monitoring station in the region, or subdomains, exceed these CAAQS.

For monitoring stations that exceed the respective NAAQS or CAAQS, the PM threshold was assumed to be equal to the difference between the applicable NAAQS or CAAQS level for PM concentrations (refer to Table 4.3-1) and the monitored Design Value (DV) for that region. For monitoring stations that do not exceed the respective NAAQS or CAAQS, incremental federal Significant Impact Levels (SIL), are which are used to ensure that a project's emissions do not contribute to an air quality violation. Currently, there are no violations of the PM10 and PM2.5 NAAQS at these monitoring stations, so all comparisons to NAAQS are based on the difference between the design value and the NAAQS. For monitoring stations that do not exceed the appropriate CAAQS, comparisons to appropriate CAAQS are based on the difference between the DV and the CAAQS. Monitoring stations that do exceed some or all CAAQS (Downtown and Chula Vista), comparisons to appropriate CAAQS are based on the appropriate SIL, which are 3 $\mu g/m^3$ for annual PM10 CAAQS, and 5 $\mu g/m^3$ for 24-hour PM10 CAAQS.

Sensitive receptors are specific locations where air pollutant concentrations are simulated in the dispersion model. For PM10 and PM2.5 modeling, sensitive receptors represent locations beyond the roadway or railway boundaries where the general public may be exposed to air pollutants. In AERMOD, ambient receptors are placed on a regular grid, spaced 50 meters apart. Thus, the area represented by a single receptor is 50 meters by 50 meters, which is 2,500 square meters (0.62 acre). The land area (in acres) in the tables below was estimated based on multiplying the number of receptors that exceed a threshold by 0.62 acre. The acreage estimates are provided to contextualize results, and are not considered precise estimates of exposure.

Health Impacts

As discussed in Section 4.3.1, short-term and long-term exposure to PM10 and PM2.5 may result in adverse health effects including:

- Aggravated asthma
- Increases in respiratory symptoms like coughing and difficult or painful breathing
- Chronic bronchitis
- Decreased lung function
- Heart attack
- Premature death

The ambient air quality standards are health-based standards. Therefore, in this impact analysis, when the proposed Plan would result in a new violation of a particulate standard or substantially contribute to an existing violation, it would also contribute to these adverse health effects. Health impacts of diesel particulates, a TAC and subset of PM10 and PM2.5 emissions, are analyzed separately in Impact AQ-5.

This analysis identifies and maps receptors in 2016 and future years within the areas exposed to specified concentrations of PM10 and PM2.5 emitted from Plan sources. These receptors would be at greatest risk of experiencing the health effects listed above.

Given the limitations of modeling tools and assumptions, receptor exposure numbers are an indication of relative exposure, and not a precise prediction. Also, because of the conservative modeling assumptions (see Appendix D to the EIR), the analysis presents maximum ambient air quality impacts. For these reasons, the actual exposure to particulate matter would likely be lower than presented in this analysis. Proven scientific models that are designed to quantitatively correlate mass emissions of particulates from a plan or project to project-specific localized health impacts (e.g., number of cases of decreased lung function) are not available.

Similarly, given the limitations of the localized particulate methodology, it is not possible to directly and accurately correlate increased standards violations to project-specific health impacts. The localized health effects of new PM standard violations or substantial contributions to existing violations are best quantified by the Impact AQ-5 health risk assessment for TACs, which include air toxics and diesel particulates.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Maximum changes in concentrations of 24-hour and annual levels of PM2.5 and PM10 from 2016 to 2025 from major roadways freeways and highways under implementation of the proposed Plan are shown in Table 4.3-9 and Table 4.3-10, respectively. For PM2.5, modeling shows a small decrease in concentrations in some areas, no change in some areas, and a small increase in some areas. However, all increases would be less than the criteria identified above for a new violation or substantial contribution to an existing violation. This impact is less than significant.

For PM10, modeling shows no change in some areas and a small increase in some areas. However, concentrations would increase above thresholds within the Escondido domains for the annual CAAQS, as well as in Chula Vista for the 24-hour CAAQS. These exceedances in Escondido and Chula Vista are due primarily to road dust from freeway travel.[5] The maximum increases in both Escondido and Chula Vista are at receptor locations immediately adjacent to I-15 and I-5, respectively. These PM10 increases could contribute to a new violation or substantial contribution to an existing violation. The impact for PM10 is significant. The locations of PM10 exceedances for 2025 are shown in Figure 4.3-2.

Table 4.3-9
Summary of Incremental PM2.5 Concentrations, 2025

Standard	Maximum Incremental Concentration (µg/m³)	Area of Threshold Exceedance (acres)	Significant Impact?
PM2.5 Annual CAAQS	0.6	0	No
PM2.5 24-hr CAAQS	1.0	0	No
PM2.5 Annual NAAQS	1.0	0	No

Source: Appendix D.

Table 4.3-10
Summary of Incremental PM10 Concentrations, 2025

Standard	Maximum Incremental Concentration (µg/m³)	Area of Threshold Exceedance (acres)	Significant Impact?
PM10 24-hr NAAQS	4	0	No
PM10 Annual CAAQS	2	33	Yes [1]

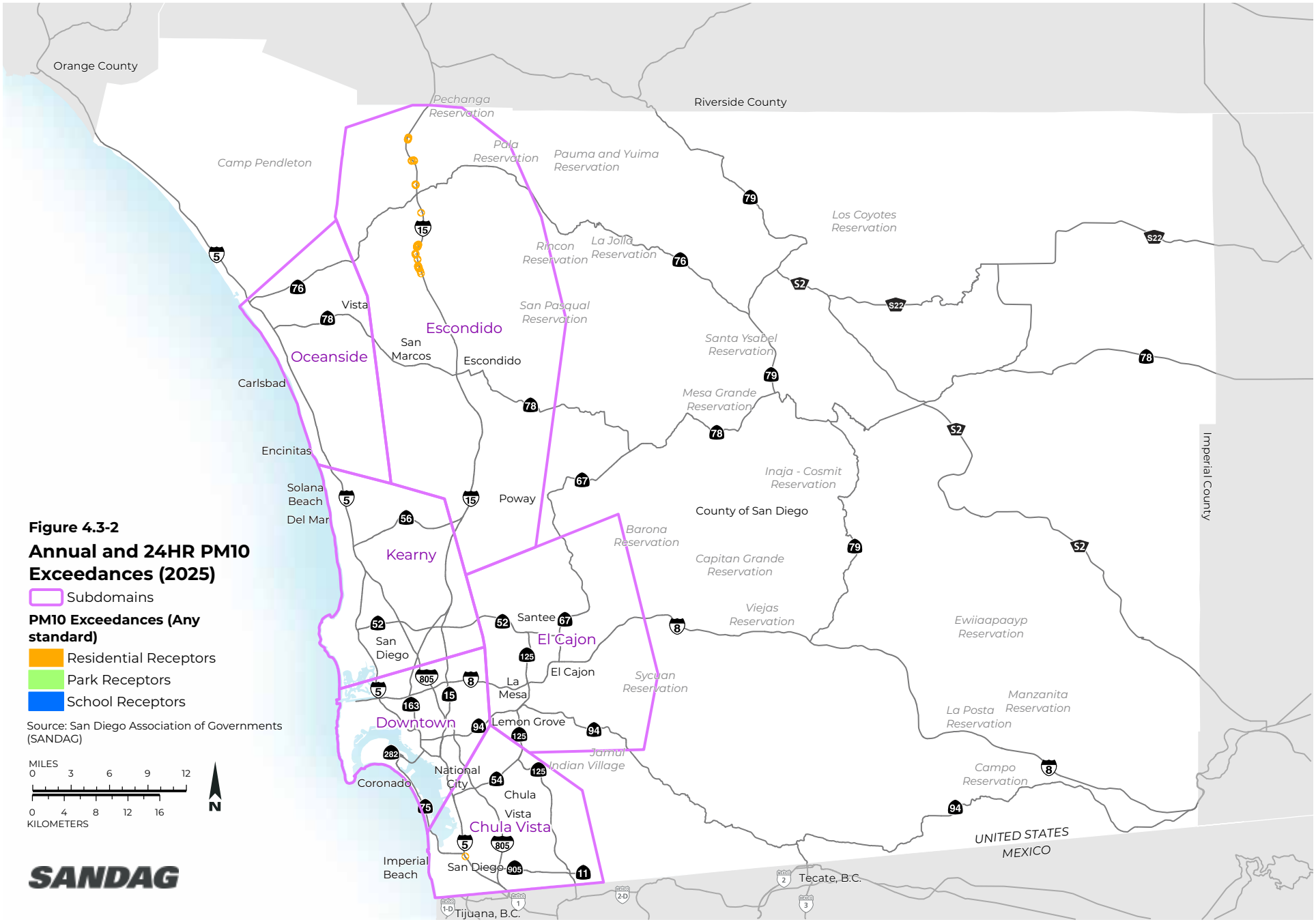
[5] While brake and tire wear emissions would make up a portion of the modeled PM10 concentrations in Escondido and Chula Vista, the largest source of PM10 emissions that contribute to the modeled PM10 concentrations is from road dust.

PM10 24-hour CAAQS	6	1	Yes [2]

Source: Appendix D.
[1] These exceedances are in the Escondido domain
[2] These exceedances are in the Chula Vista domain

2025 Conclusion

Implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2025 under the proposed Plan would not substantially contribute to violations or create new violations of 24-hour PM10 NAAQS, annual PM2.5 NAAQS or CAAQS, or 24-hour PM2.5 CAAQS. However, implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2025 under the proposed Plan could substantially contribute to violations or create new violations of annual PM10 CAAQS in the Escondido domains, and the 24-hour PM10 CAAQS in the Chula Vista domain. Therefore, this impact is significant in 2025.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Vista
Escondido
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Kearny
County of San Diego
Santee
El Cajon
San Diego
La Mesa
El Cajon
Downtown
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.3-2
Annual and 24HR PM10 Exceedances (2025)
Subdomains
PM10 Exceedances (Any standard)
Residential Receptors
Park Receptors
School Receptors
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Maximum changes in concentrations of 24-hour and annual levels of PM2.5 and PM10 from 2016 to 2035 from major roadways, freeways, and highways with implementation of the proposed Plan are shown in Tables 4.3-11 and 4.3-12, respectively. For PM2.5, modeling shows no change in some areas and a small increase in some areas. However, all increases would be less than the criteria identified above for a new violation or substantial contribution to an existing violation. This impact for PM2.5 is less than significant.

For PM10, modeling shows no change in some areas and a small increase in some areas. However, concentrations would increase above thresholds within the El Cajon and Escondido domains for the annual CAAQS, as well as in Chula Vista for the 24-hour CAAQS.

These exceedances in El Cajon, Escondido, and Chula Vista are due primary to road dust from freeway travel.[6] The maximum increase in El Cajon is at a single receptor location immediately adjacent SR-125; the maximum increases in Escondido are at receptor locations immediately adjacent I-15 and SR-78; and the maximum increases in Chula Vista are at receptor locations immediately adjacent I-5 both south and north of SR-905, and along SR-905. These PM10 increases could contribute to a new violation or substantial contribution to an existing violation. The impact for PM10 is significant. The locations of PM10 exceedances for 2035 are shown in Figure 4.3-3.

Table 4.3-11
Summary of Incremental PM2.5 Concentrations, 2035

Standard	Maximum Incremental Concentration (µg/m^3)	Area of Threshold Exceedance (acres)	Significant Impact?
PM2.5 Annual CAAQS	0.6	0	No
PM2.5 24-hr CAAQS	1.0	0	No
PM2.5 Annual NAAQS	1.0	0	No

Source: Appendix D.

Table 4.3-12
Summary of Incremental PM10 Concentrations, 2035

Standard	Maximum Incremental Concentration (µg/m^3)	Area of Threshold Exceedance (acres)	Significant Impact?
PM10 24-hr NAAQS	10	0	No
PM10 Annual CAAQS	3	113	Yes [1]
PM10 24-hour CAAQS	14	6	Yes [2]

Source: Appendix D.
[1] These exceedances are mostly in the Escondido domain (112.4 acres), with some exceedances in the El Cajon domain (0.6 acres)
[2] These exceedances are in the Chula Vista domain

[6] Ibid.

2035 Conclusion

Implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2035 under the proposed Plan would not substantially contribute to violations or create new violations of 24-hour PM10 NAAQS, annual PM2.5 NAAQS or CAAQS, or 24-hour PM2.5 CAAQS. However, implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2035 under the proposed Plan could substantially contribute to violations or create new violations of annual PM10 CAAQS in the El Cajon and Escondido domains, and the 24-hour PM10 CAAQS in the Chula Vista domain. Therefore, this impact is significant in 2035.

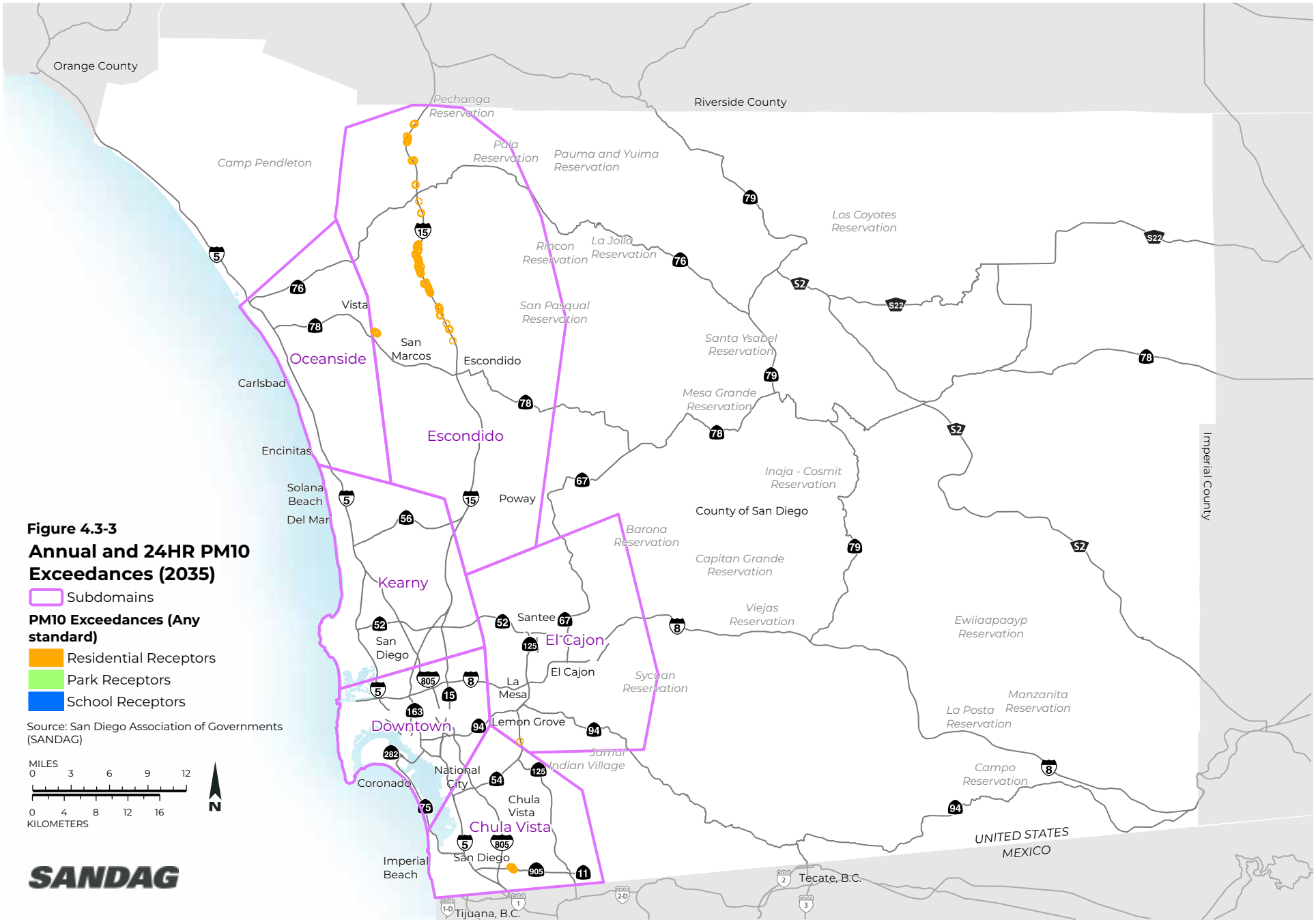


Figure 4.3-3

Annual and 24HR PM10 Exceedances (2035)

Subdomains

PM10 Exceedances (Any standard)

- Residential Receptors
- Park Receptors
- School Receptors

Source: San Diego Association of Governments (SANDAG)

MILES
0 3 6 9 12

0 4 8 12 16
KILOMETERS

N

SANDAG

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Maximum changes in concentrations of 24-hour and annual levels of PM2.5 and PM10 from 2016 to 2050 from major roadways, freeways, and highways under implementation of the proposed Plan are shown in Tables 4.3-13 and 4.3-14, respectively. For PM2.5, modeling shows no change in some areas and a small increase in some areas. However, all increases would be less than the criteria identified above for a new violation or substantial contribution to an existing violation. The impact for PM2.5 is less than significant.

For PM10, modeling shows no change in some areas and a small increase in some areas. However, concentrations would increase above thresholds within the Kearny, El Cajon, and Escondido domains for the annual CAAQS, as well as in Chula Vista for the 24-hour CAAQS.

These exceedances in El Cajon, Escondido, and Chula Vista are due primarily to road dust from freeway travel.[7] The maximum increase in El Cajon is at receptor locations immediately adjacent to SR-125 and along I-8 in La Mesa, El Cajon, and near the interchange with SR-125; the maximum increases in Escondido are at various receptor locations immediately adjacent to I-15 and SR-78; and the maximum increases in Chula Vista are at receptor locations immediately adjacent to I-5 both south and north of SR-905, and along SR-905.

These PM10 increases could contribute to a new violation or substantial contribution to an existing violation. The impact for PM10 is significant. The locations of PM10 exceedances for 2050 are shown in Figure 4.3-4.

Table 4.3-13
Summary of Incremental PM2.5 Concentrations, 2050

Standard	Maximum Incremental Concentration (µg/m^3)	Area of Threshold Exceedance (acres)	Significant Impact?
PM2.5 Annual CAAQS	0.7	0	No
PM2.5 24-hr CAAQS	2	0	No
PM2.5 Annual NAAQS	1	0	No

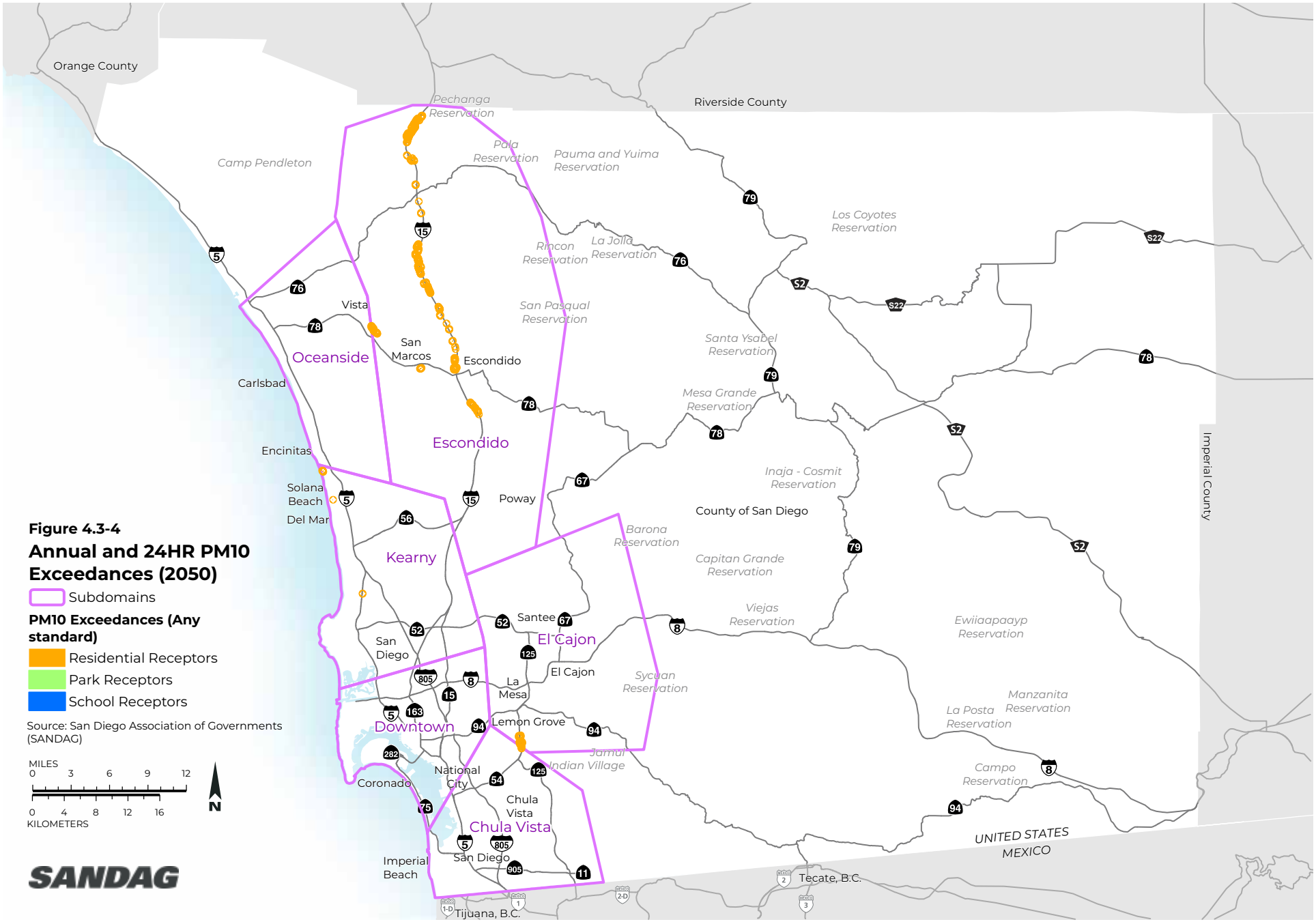
Source: Appendix D.

Table 4.3-14
Summary of Incremental PM10 Concentrations, 2050

Standard	Maximum Incremental Concentration (µg/m^3)	Area of Threshold Exceedance (acres)	Significant Impact?
PM10 24-hr NAAQS	10	0	No
PM10 Annual CAAQS	4	273	Yes [1]
PM10 24-hour CAAQS	15	2	Yes [2]

Source: Appendix D.
[1] These exceedances are mostly in the Escondido domain (241.5 acres), in the El Cajon domain (24.7 acres), with some exceedances in the Kearny domain (6.2 acres)
[2] These exceedances are in the Chula Vista domain.

[7] Ibid.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
County of San Diego
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Vista
San Marcos
Escondido
Oceanside
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Kearny
Santee
El Cajon
La Mesa
Lemon Grove
San Diego
Downtown
National City
Coronado
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tecate, B.C.
Tijuana, B.C.
Figure 4.3-4
Annual and 24HR PM10 Exceedances (2050)
Subdomains
PM10 Exceedances (Any standard)
Residential Receptors
Park Receptors
School Receptors
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

2050 Conclusion

Implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2050 under the proposed Plan would not substantially contribute to violations or create new violations of 24-hour PM10 NAAQS, annual PM2.5 NAAQS or CAAQS, or 24-hour PM2.5 CAAQS. However, implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2050 under the proposed Plan could substantially contribute to violations or create new violations of annual PM10 CAAQS in the Kearny, El Cajon, and Escondido domains, and the 24-hour PM10 CAAQS in the Chula Vista domain. Therefore, this impact is significant in 2050.

Exacerbation of Climate Change Effects

The proposed Plan is expected to exacerbate climate change effects on exposing sensitive receptors to substantial PM10 and PM2.5 concentrations. Climate change may result in increased wildfire frequency and intensity, which can increase emissions of particulate matter. Precipitation during dry seasons may also decrease under climate change, reducing regional ability to fight wildfires and reduce this source of particulate matter (Reidmiller et al. 2018). Furthermore, as mentioned in Section 4.3.1, climate change could increase the incidence of flooding and wildfire that may block routes and disrupt traffic; this could increase vehicle idling and thus increase the amount of PM10 and PM2.5 coming from vehicles (WSP 2018).

As the proposed Plan would result in increased exposure of sensitive receptors to PM10 and PM2.5 (Impact AQ-4), the air quality impacts expected from climate change may add to the proposed Plan's PM impacts.

MITIGATION MEASURES

AQ-4 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL PM10 AND PM2.5 CONCENTRATIONS

2025, 2035, and 2050

Implement mitigation measure **AQ-2a**, as discussed under Impact AQ-2. Mitigation measure **AQ-2a** would reduce road dust from freeway travel, which is the primary cause of the PM10 exceedances discussed herein.

The following mitigation measures presented in Section 4.8 will further reduce PM10 and PM2.5 emissions:

- **GHG-5a. Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans**
- **GHG-5b. Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure**
- **GHG-5d. Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide**
- **GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects**

The following mitigation measure presented in Section 4.16 will further reduce PM10 and PM2.5 emissions by reducing VMT:

- **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects**

In addition, the following measure is proposed:

AQ-4 Reduce Exposure to Localized Particulate Emissions. During planning, design, and project-level CEQA review of transportation network improvements and programs, and during planning, design, and project-level CEQA review of development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, evaluate the potential particulate matter concentration impacts of the project using applicable procedures and guidelines for such analyses. If exceedances of PM10 or PM2.5 standards are predicted, SANDAG shall, and other transportation project sponsors can and should, apply measures to reduce PM emissions, including but not limited to the following:

- Design sites to locate sensitive receptors more than 500 feet of a freeway, 500 feet of urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
- Design sites to locate sensitive receptors more than 1,000 feet of a major diesel rail service or railyards.

Where adequate buffer cannot be implemented, implement the following:

- Install air filtration (as part of mechanical ventilation systems or stand-alone air cleaners) to indoor reduce pollution exposure for residents and other sensitive populations in buildings that are close to transportation network improvement projects. Use air filtration devices rated MERV-13 or higher. As part of implementing this measure, require an ongoing maintenance plan for the building's Heating, Ventilation and Air Conditioning (HVAC) air filtration system. Air filtration devices rated MERV-13 are estimated to reduce indoor levels of particulates by 75 to 90 percent (CARB 2017b).
- Plant trees and/or vegetation suited to trapping roadway air pollution and/or sound walls between sensitive receptors and the pollution source. This measure would trap pollution emitted from pollution sources such as freeways, reducing the amount of pollution to which residents and other sensitive populations would be exposed. The vegetation buffer should be thick, with full coverage from the ground to the top of the canopy (CARB 2017c, EPA 2016). Vegetation can be combined with sound walls to further reduce pollution exposure, particularly for locations immediately behind the barrier.
- Design streets that have more open space and varied building heights.
- Move bus stops and other gathering location farther from intersections.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Mitigation measure **AQ-2a will help secure incentive funding to reduce PM emissions from mobile sources. Mitigation measure AQ-4 will** reduce the exposure of sensitive receptors to localized PM emissions with the implementation of design measures.

Mitigation measures GHG-5a, GHG-5b, GHG-5d, and GHG-5f would reduce PM10 and PM2.5 emissions from tire wear, brake wear, and vehicle exhaust, as discussed in Section 4.8. In addition, mitigation measure TRA-2 would reduce criteria pollutants through project-level VMT reduction measures, as discussed in Section 4.16. Measures to reduce VMT or vehicle exhaust (e.g., EVs) in these mitigation measures would reduce PM10 and PM2.5 emissions and associated concentrations.

Although mitigation would reduce impacts, there is no guarantee that all projects would be reduced to below a level of significance. Impacts would remain significant for the Escondido and Chula Vista areas for 2025, 2035, and 2050 and the El Cajon area for 2035 and 2050. Thus, impacts would be significant and unavoidable.

AQ-5 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL TAC CONCENTRATIONS

ANALYSIS METHODOLOGY

This analysis addresses the exposure of sensitive receptors to substantial concentrations of TACs. A health risk assessment was performed to analyze exposure of sensitive receptors to substantial concentrations of TACs; increases in cancer risk associated with such exposure. For this analysis, sensitive receptors are defined as residential, school, and recreational land uses.

The cancer risk of a given area is a measure of any one person's likelihood of contracting cancer due to exposure from a particular carcinogen; it is not a measure of how many people will contract cancer. For example, for an area with an increase in cancer risk of 10 in 1 million, any one person's likelihood of contracting cancer would increase by 10 chances in 1 million (i.e., increased likelihood of contracting cancer would increase by 0.001 percent). Moreover, in estimating any one person's cancer risk in residential uses, the analysis assumes that person would stay in the same place for 30 years, 7 days a week, 24 hours a day, 350 days a year. The analysis follows the OEHHA guidelines (OEHHA 2015), and utilizes the 95th percentile breathing rates and other conservative assumptions to calculate exposure to TACs. Accordingly, it is designed to provide a conservative estimate of cancer risk, and likely overestimates actual impacts that would occur.

This analysis evaluates both increases in cancer risk from the baseline risk, and total (or cumulative) cancer risk from the transportation network, including diesel locomotives, stationary sources, and on-road mobile sources. The increased cancer risk analysis compares the estimated risks for 2025, 2035, and 2050 with the existing baseline risks (2016), and evaluates whether there is an increase above 10 in 1 million (i.e., the likelihood of contracting cancer would increase by 0.001 percent) from changes in the transportation network. Total (or cumulative) cancer risk is not based on a comparison with baseline levels, but rather identifies the areas in which the total (or cumulative) cancer risk from the transportation network plus stationary sources would exceed 100 in 1 million (i.e., likelihood of contracting cancer of 0.01 percent) in 2025, 2035, and 2050.

Note that from the Draft EIR to the Final EIR, SANDAG revised its ABM2+ model to reflect minor modifications to the transportation network improvements as well as minor modeling corrections. Those modeling changes result in lower VMT for baseline (2016) and Plan years (2025, 2035, and 2050), which would reduce emissions for baseline (2016) and Plan years (2025, 2035, and 2050). No update to the air quality modeling is required because the air quality model results are conservative and these changes would not change any conclusions in this EIR.

Exposure to TACs may result in noncancer health effects as well as increases in cancer risk, as described in Section 4.3.1, *Existing Conditions*. The noncancer health effects analysis involves calculating the total health hazard index (THI) (OEHHA 2015). A health hazard index is a comparison of the concentration of a TAC to the level at which adverse noncancer health effects would be experienced (the recommended exposure limit [REL] for TAC emissions). The calculation involves dividing the predicted TAC concentration by its REL. This analysis focused on evaluating the THI at the maximally exposed individual receptor (MEIR). If the maximum THI is greater than 1.0, the concentration to which an individual is exposed would be above the level at which noncancer health effects could occur, and a significant impact would result. If it is below 1.0, then noncancer health effects would not be expected to occur. The analysis examines generation of TACs from planned transportation network improvements and programs under the proposed Plan, and placement of existing and new sensitive receptors under forecasted regional growth and land use change under the proposed Plan in locations where they would be exposed to substantial concentrations of TACs. Note that transportation network improvements and programs under the proposed Plan include both increased motor vehicle travel on

the roadway network and new commuter rail lines throughout the region, as shown in Figures 2-25 and 2-34 in Chapter 2, *Project Description*. As described in detail above, the following criteria are used to evaluate whether implementation of the proposed Plan would expose sensitive receptors to substantial concentrations of TACs:

1. Does the proposed Plan result in increases in cancer risk to sensitive receptors over baseline (2016) conditions that exceed 10 in 1 million?
2. Does the proposed Plan expose sensitive receptors to total cancer risks above 100 in 1 million?
3. Does the proposed Plan result in increases in health risks to sensitive receptors for noncancer hazards as measured by a THI above 1.0?

The analysis also discloses TAC exposure of new land use added by the Regional Plan's regional growth and land use changes. Sensitive receptors associated with new land uses include future residential and park uses near existing pollution sources, such as roads, rail, and stationary sources.

The Supreme Court in *California Building Industry Assoc. v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369 (*CBIA v. BAAQMD*) considered the issue of whether such TAC exposure of new receptors added by a project represents an environmental impact under CEQA. In that case, the California Building Industry Association challenged the Bay Area Air Quality Management District's (BAAQMD) adoption of new CEQA thresholds for determining whether a project's exposure to existing levels of TACs would result in a significant impact. The Supreme Court's review of the case focused on whether CEQA requires an analysis of how existing environmental conditions will impact future residents or users (receptors) of a proposed project. After reviewing the CEQA statute and Section 15126.2(a) of the State CEQA Guidelines, the Court concluded that CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents.

The Court did not exclude all consideration of existing hazards from CEQA analysis. An agency must evaluate existing conditions in order to assess whether a project could exacerbate hazards that are already present. In light of the Court's decision, exposure of future project land uses to existing air quality conditions, including TAC risks, that would not be exacerbated by a project are not subject to CEQA analysis. Nevertheless, recognizing the unique nature of the Proposed Regional Plan, which includes both regional growth and land use change and transportation network improvements, the Impact AQ-5 analysis voluntarily does consider such exposure of future land uses to existing TAC risks as an impact. The methodology and detailed results for the health risk assessment are described in detail in Appendix D. Due to the nature of this analysis, the combined impacts of regional growth and land use change and transportation network improvements and programs are presented together.

Health Impacts

Exposure to diesel particulates and TACs may result in adverse health effects, both increased cancer risk as well as noncancer health effects, as described in Section 4.3.1.

This HRA identifies and maps sensitive receptors in 2016 and future years within the areas exposed to specified concentrations of TAC emissions to determine where cancer and non-cancer risk thresholds are exceeded. For the HRA, sensitive receptors are locations represented by residential, school, and recreational land uses. HRA results are presented separately for cancer and non-cancer effects. For cancer risks, the results include a summary of the risk at the maximally exposed sensitive receptor, and the area (in acres) that exceed the applicable threshold, which is 10 in 1 million for plan-level increase in risk and 100 in 1 million for cumulative

effects. For non-cancer risks, the results include a summary of the risk at the maximally exposed sensitive receptor, and the area (in acres) that exceed the applicable threshold, which is 1.0 for both chronic and acute hazard effects.

Given the limitations of modeling tools and assumptions, sensitive receptor exposure numbers are an indication of relative exposure, and not a precise prediction. Actual exposure would be lower because of the conservative EMFAC 2017 modeling assumptions used in the cancer risk analysis (see above). The cancer risk of a given area is a measure of any one person's likelihood of contracting cancer due to exposure from a particular carcinogen; it is not a measure of how many people will contract cancer.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Criterion 1: Does the proposed Plan result in increases in cancer risk to sensitive receptors over baseline (2016) conditions that exceed 10 in 1 million?

Table 4.3-15 summarizes health effects in 2025 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental risk at the maximally exposed sensitive receptors is below 2016 conditions. For all residential, park, or school sensitive receptors near existing roadway and rail sources, there are no sensitive receptors that show an increase in cancer risk in 2025 relative to 2016 conditions. Therefore, the impact on sensitive receptors near existing emission sources is less than significant.

For sensitive receptors near new emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due almost exclusively to the new commuter rail lines. The maximally exposed areas are within the Downtown domain, but Chula Vista and Oceanside see an increase due to expanded rail services. Risk exceeds the 10 in 1 million threshold in a number of locations due to new rail activity. Therefore, the impact on sensitive receptors near new emission sources is significant.

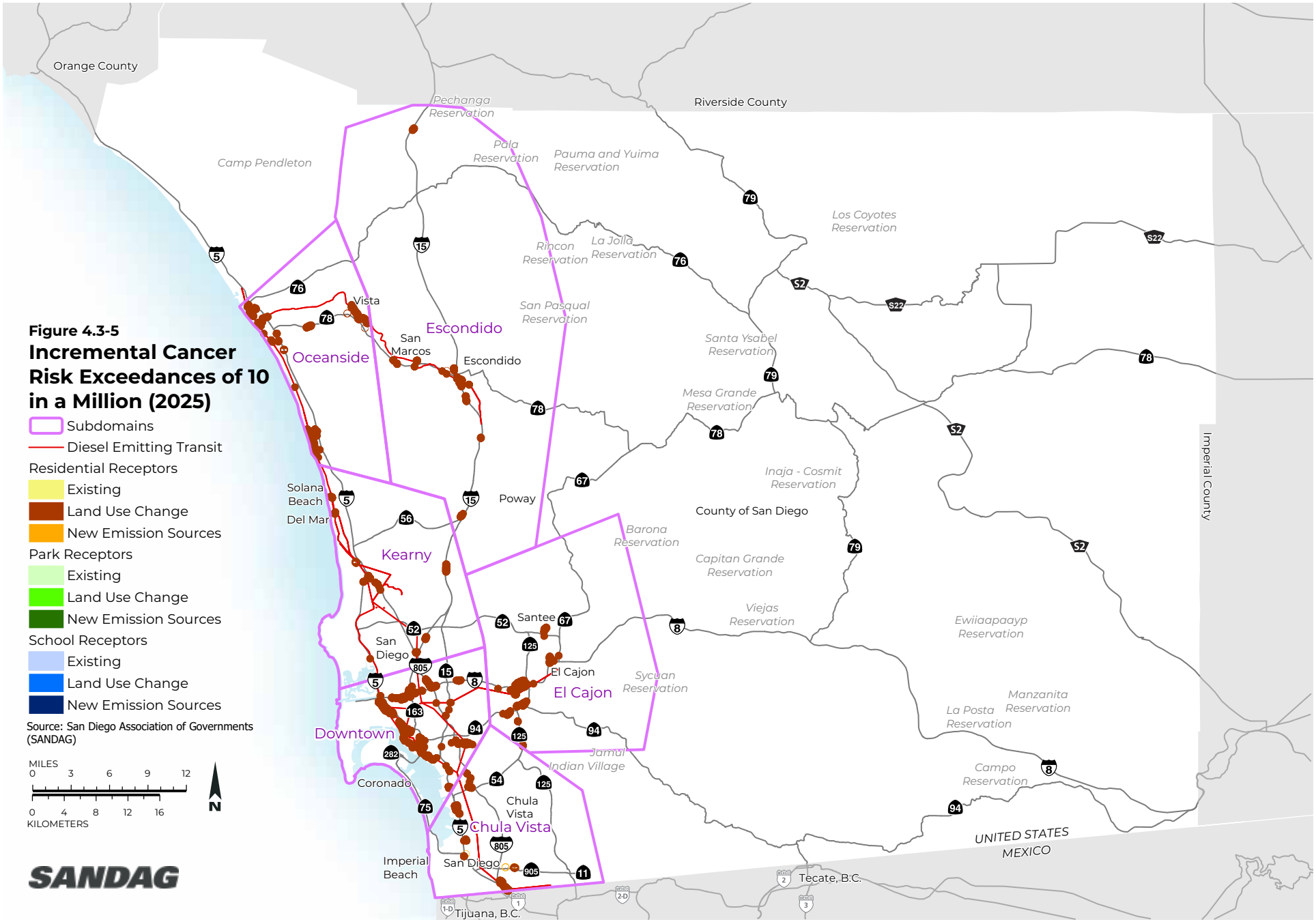
For new sensitive receptors in new land uses, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due to siting of new residential uses near existing rail and roadway sources. The maximally exposed areas are within the Downtown, El Cajon, and Chula Vista domains. Risk exceeds the 10 in 1 million threshold in a number of locations due to the siting of new land uses. Therefore, the impact on new sensitive receptors in new land uses is significant.

Sensitive receptors exposed to new emission sources and new sensitive receptors that show an incremental increase in cancer risk above thresholds in 2025 are shown in Figure 4.3-5.

Table 4.3-15
Summary of Cancer Health Risk, 2025

Receptor Type	2016		2025	
	Maximum Cancer Risk (per million)	Area of Threshold Exceedance (acres)	Maximum Incremental Cancer Risk (per million)	Incremental Area of Threshold Exceedance (acres)
Existing Sources				
Residential	447	7,563	-5	0
Recreational	13	24	0	0
School	11	2	0	0
New Sources				
Residential	--	--	54	7
Recreational	--	--	3	0
School	--	--	0	0
New Land Uses				
Residential	--	--	149	948
Recreational	--	--	0	0
School	--	--	0	0

Source: Appendix D.
Notes: Cancer risk threshold is 10 in 1 million. Modeled cancer risks were rounded to the nearest whole number.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
County of San Diego
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Jamul Indian Village
Campo Reservation
Vista
Escondido
San Marcos
Escondido
Oceanside
Solana Beach
Del Mar
Poway
Kearny
Santee
San Diego
El Cajon
El Cajon
Downtown
Coronado
Chula Vista
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.3-5
Incremental Cancer Risk Exceedances of 10 in a Million (2025)
Subdomains
Diesel Emitting Transit
Residential Receptors
Existing
Land Use Change
New Emission Sources
Park Receptors
Existing
Land Use Change
New Emission Sources
School Receptors
Existing
Land Use Change
New Emission Sources
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Criterion 2: Does the proposed Plan expose sensitive receptors to total cumulative cancer risks above 100 in one 1 million?

Table 4.3-16 summarizes cumulative health risk at residential sensitive receptors in 2025 relative to 2016 conditions. As shown, the maximum cumulative cancer risk and the number of sensitive receptors in the modeling exposed to 100 per million health risk would decrease. This reduction in exposure is due in part to regulatory policies that reduce emissions from diesel trains and vehicles and gasoline vehicles due to state and federal programs designed to reduce emissions of TACs and improve fuel efficiency. Thus, reductions in the number of exposed individuals would occur despite the proposed Plan's forecasted increase in the population and housing units within the region.

Table 4.3-16
Summary of Cumulative Health Risk, 2025

Receptor Type	2016		2025		2025 vs. 2016	
	Maximum Cumulative Cancer Risk (per million)	Area of Threshold Exceedance (acres)	Maximum Cumulative Cancer Risk (per million)	Area of Threshold Exceedance (acres)	Change in Maximum Cumulative Cancer Risk (per million)	Change in Area of Threshold Exceedance (acres)
Residential	1,015	7,570	946	7,439	-69	-131

Source: Appendix D.
Note: Modeled cancer risks were rounded to the nearest whole number.

The SCS portion of the proposed Plan includes proposed land use changes, with a focus on development within Mobility Hubs or Smart Growth Opportunity Areas. These Mobility Hubs are proposed for communities with a high concentration of people, destinations, and travel choices where densification is envisioned in the SCS. Many of these proposed land uses are within areas that are near existing pollution sources. Although the proposed Plan would contribute TAC emissions at both the regional and local scale, these increases would not increase existing hazards, when taking into account the reduction of emissions over time due to regulatory policies.

A summary of TAC emissions is shown in Table 4.3-17. Overall, TAC emissions reduce 62 to 91 percent relative to 2016. Given this reduction in TACs, the proposed Plan would not increase existing hazards, taking into account the effect of regulatory policies over time. Based on the above analysis, this impact is therefore less than significant.

Table 4.3-17
Summary of Toxic Air Contaminants Tons per Year, 2025

Year	Butadiene1,3	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	Naphthalene	PAH	DPM
2016	0.023	0.110	0.0120	0.26	0.120	0.220	0.0230	0.00008	0.530
2025	0.002	0.032	0.0029	0.10	0.041	0.079	0.0065	0.00004	0.093
Change vs. 2016	-91%	-71%	-76%	-62%	-66%	-64%	-72%	-41%	-82%

Source: Appendix D.
Note: Some values have been rounded to the nearest ten thousandths or hundred thousandths.

Criterion 3: Does the proposed Plan result in increases in health risks to sensitive receptors for noncancer hazards as measured by a THI above 1.0?

Table 4.3-18 summarizes non-cancer health effects in 2025 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental non-cancer risk at the maximally exposed sensitive receptors is below 2016 conditions. For all residential, park, or school sensitive receptors near existing roadway and rail sources, there are no sensitive receptors that show an increase in chronic hazard or acute hazard in 2025 relative to 2016 conditions. Therefore, the impact on sensitive receptors near existing emission sources is less than significant.

For sensitive receptors that would be exposed to new emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds the chronic threshold at residential and recreational receptors. The maximally exposed areas are within the Downtown and Chula Vista domains. Non-cancer chronic risk at various residential and recreational receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on sensitive receptors near new emission sources is significant.

For new sensitive receptors in new land uses that would be exposed to existing emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds both the acute and the chronic threshold at residential uses. The maximally exposed area for acute hazard is within the Escondido domain. The maximally exposed area for chronic hazard is within the El Cajon domain, with exceedances in each domain. Non-cancer acute and chronic risk at various residential receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on new sensitive receptors in new land uses is significant.

Table 4.3-18
Summary of Noncancer Hazards, 2025

Receptor Type	2016 Maximum Hazard Index		Maximum Incremental Change vs. 2016		Incremental Area of Threshold Exceedance (acres)	
	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard
Existing Sources						
Residential	6.9	52.9	-0.1	-0.6	0	0
Recreational	2.3	37	-0.1	-0.8	0	0
School	1.5	24.9	0	0	0	0
New Sources						
Residential	--	--	0.2	5.4	0	7
Recreational	--	--	0.3	6.8	0	5
School	--	--	0	0	0	0
New Land Uses						
Residential	--	--	2.1	14.9	5	950
Recreational	--	--	0	0	0	0
School	--	--	0	0	0	0

Source: Appendix D.
Notes: Noncancer hazard risk threshold is 1.0 for both Acute and Chronic Hazards. Modeled noncancer hazard risks were rounded to the nearest one decimal place.

2025 Conclusion

Implementation of the proposed Plan would not expose existing sensitive receptors, but would expose new receptors, to substantial concentrations of TAC emissions. Therefore, this impact is significant in 2025.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Criterion 1: Does the proposed Plan result in increases in cancer risk to sensitive receptors over baseline (2016) conditions that exceed 10 in 1 million?

Table 4.3-19 summarizes health effects in 2035 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental risk at the maximally exposed receptors is below 2016 conditions. There are no existing residential, park, or school receptors that show an increase in cancer risk in 2035. Therefore, the impact on existing sensitive receptors near existing emission sources is less than significant.

For sensitive receptors near new emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due almost exclusively to the new commuter rail lines. The maximally exposed areas are within the El Cajon and Downtown domains. Risk exceeds the 10 in 1 million threshold in a

number of locations due to new rail activity. Therefore, the impact on sensitive receptors near new emission sources is significant.

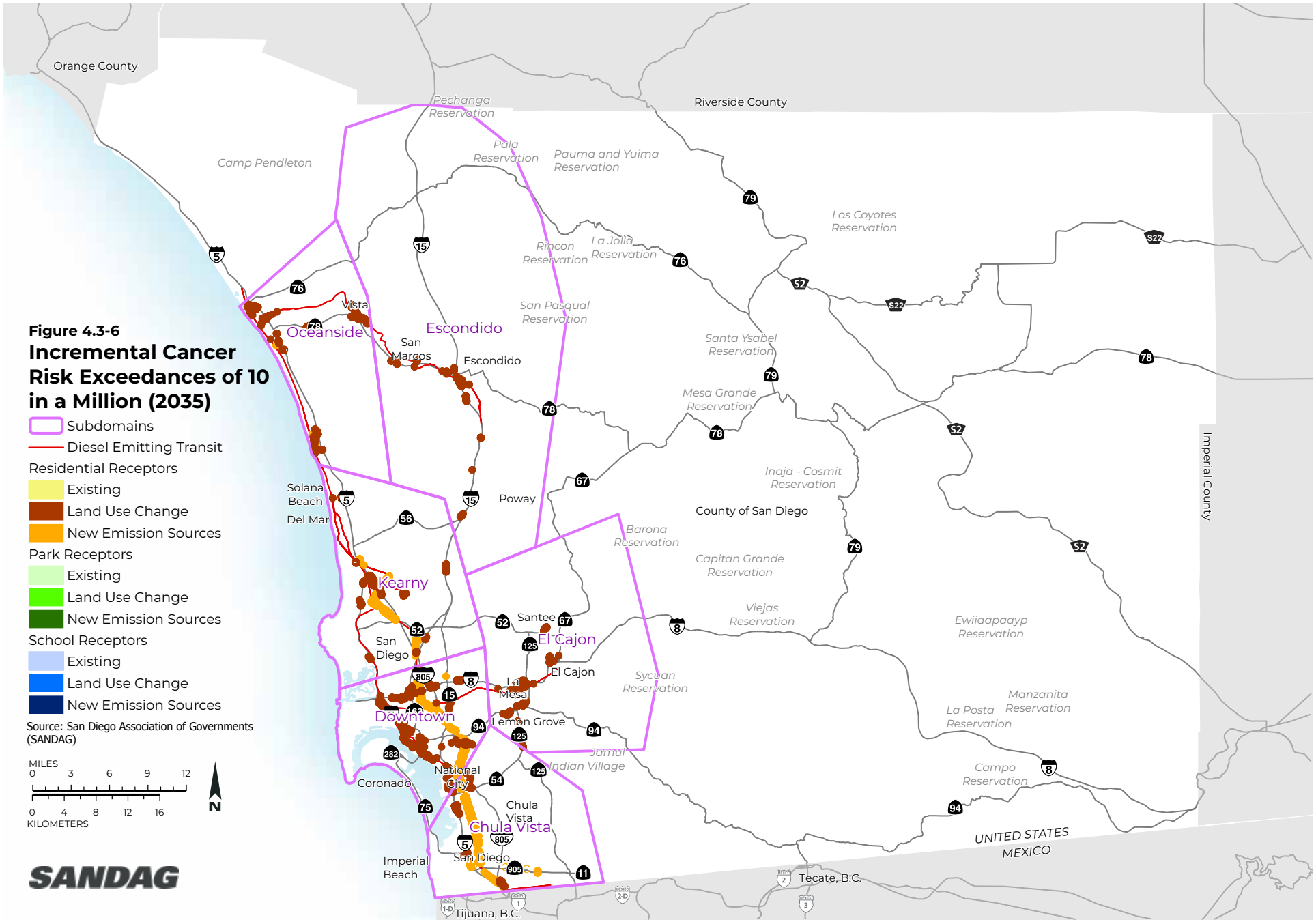
For new sensitive receptors in new land uses, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due siting of new residential uses near existing rail and roadway sources. The maximally exposed areas are within the Downtown and El Cajon domains. Risk exceeds the 10 in 1 million threshold in a number of locations due to the siting of new land uses. Therefore, the impact on new sensitive receptors in new land uses is significant.

Sensitive receptors exposed to new emission sources and new sensitive receptors that show an incremental increase in cancer risk above thresholds in 2035 are shown in Figure 4.3-6.

Table 4.3-19
Summary of Cancer Health Risk, 2035

Receptor Type	2016		2035	
	Maximum Cancer Risk (per million)	Area of Threshold Exceedance (acres)	Maximum Incremental Cancer Risk (per million)	Incremental Area of Threshold Exceedance (acres)
Existing Sources				
Residential	447	7,563	-6	0
Recreational	13	25	0	0
School	11	2	0	0
New Sources				
Residential	--	--	132	1,261
Recreational	--	--	2	0
School	--	--	0	0
New Land Uses				
Residential	--	--	137	1,155
Recreational	--	--	0	0
School	--	--	0	0

Source: Appendix D.
Notes: Cancer risk threshold is 10 in 1 million. Modeled cancer risks were rounded to the nearest whole number.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
County of San Diego
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Vista
Oceanside
Escondido
San Marcos
Escondido
Solana Beach
Del Mar
Poway
Kearny
Santee
El Cajon
San Diego
El Cajon
La Mesa
Downtown
Lemon Grove
National City
Coronado
Chula Vista
Chula Vista
San Diego
Imperial Beach
UNITED STATES
MEXICO
Tecate, B.C.
Tijuana, B.C.
Figure 4.3-6
Incremental Cancer Risk Exceedances of 10 in a Million (2035)
Subdomains
Diesel Emitting Transit
Residential Receptors
Existing
Land Use Change
New Emission Sources
Park Receptors
Existing
Land Use Change
New Emission Sources
School Receptors
Existing
Land Use Change
New Emission Sources
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Criterion 2: Does the proposed Plan expose sensitive receptors to total cancer risks above 100 in one 1 million?

Table 4.3-20 summarizes cumulative health risk at residential receptors in 2035 relative to 2016 conditions. As shown, the maximum cumulative cancer risk and the number of receptors in the modeling exposed to 100 per million health risk would decrease. This reduction in exposure is due in part to regulatory policies that reduce emissions from diesel trains and vehicles and gasoline vehicles due to state and federal programs designed to reduce emissions of TACs and improve fuel efficiency. Thus, reductions in the number of exposed individuals would occur despite the proposed Plan's forecasted increase in the population and housing units within the region.

Table 4.3-20
Summary of Cumulative Health Risk, 2035

	2016		2035		2035 vs. 2016	
Receptor Type	**Maximum Cumulative Cancer Risk**	**Area of Threshold Exceedance (acres)**	**Maximum Cumulative Cancer Risk**	**Area of Threshold Exceedance (acres)**	**Change in Maximum Cumulative Cancer Risk**	**Change In Area of Threshold Exceedance (acres)**
Residential	1,015	7,570	928	7,214	-87	-356

Source: Appendix D.
Note: Modeled cancer risks were rounded to the nearest whole number.

The SCS portion of the proposed Plan includes proposed land use changes, with a focus on development within Mobility Hubs or Smart Growth Opportunity Areas. These Mobility Hubs are proposed for communities with a high concentration of people, destinations, and travel choices where densification is envisioned in the SCS. Many of these proposed land uses are within areas that are near existing pollution sources. Although the proposed Plan would contribute TAC emissions at both the regional and local scale, these increases would not increase existing hazards, when taking into account the reduction of emissions over time due to regulatory policies.

A summary of TAC emissions is shown in Table 4.3-21. As shown, project conditions in 2035 show a decrease in all TAC emissions Overall, TAC emissions reduce between 71 and 100 percent relative to 2016 conditions. Given this reduction in TACs, the proposed Plan would not increase existing hazards, taking into account the effect of regulatory policies over time. Based on the above analysis, this impact is therefore less than significant.

Table 4.3-21
Summary of Toxic Air Contaminants Emissions per Year, 2035

Year	Butadiene1,3	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	Naphthalene	PAH	DPM
2016	0.0230	0.1100	0.0120	0.2600	0.1200	0.2200	0.0230	0.0001	0.5300
2035	0.0001	0.0250	0.0020	0.0750	0.0280	0.0550	0.0046	0.00002	0.0780
Change vs. 2016	-100%	-77%	-83%	-71%	-77%	-75%	-80%	-68%	-85%

Source: Appendix D.
Notes: Some values have been rounded to the nearest ten thousandths or hundred thousandths.

Criterion 3: Does the proposed Plan result in increases in health risks to sensitive receptors for noncancer hazards as measured by a THI above 1.0?

Table 4.3-22 summarizes non-cancer health effects in 2025 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental non-cancer risk at the maximally exposed sensitive receptors is below 2016 conditions. For all residential, park, or school sensitive receptors near existing roadway and rail sources, there are no sensitive receptors that show an increase in chronic hazard or acute hazard in 2035 relative to 2016 conditions. Therefore, the impact on sensitive receptors near existing emission sources is less than significant.

For sensitive receptors that would be exposed to new emission sources, the incremental change in chronic hazard index at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The maximally exposed areas are within the El Cajon, Downtown, and Chula Vista domains, with other increases in Kearny above the threshold. Non-cancer chronic risk at various residential and recreational receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on sensitive receptors near new emission sources is significant.

For new sensitive receptors in new land uses that would be exposed to existing emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds both the acute and the chronic threshold at residential uses. The maximally exposed area for acute hazard is within the Escondido domain. The maximally exposed area for chronic hazard is within the El Cajon domain, with exceedances in Chula Vista, Downtown, Escondido, and Kearny. Non-cancer acute and chronic risk at various residential receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on new sensitive receptors in new land uses is significant

Table 4.3-22
Summary of Noncancer Hazards, 2035

Receptor Type	2016 Maximum Hazard Index		Maximum Incremental Change vs. 2016		Incremental Area of Threshold Exceedance (acres)	
	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard
Existing Sources						
Residential	6.9	52.9	0	-0.8	0	0
Recreational	2.3	37	-0.1	-0.9	0	0
School	1.5	24.9	0	0	0	0
New Sources						
Residential	-	-	0.8	14.2	0	1,266
Recreational	-	-	0.2	4.7	0	123
School	-	-	0	0	0	0
New Land Uses						
Residential	-	-	1.4	13.2	2	1,161
Recreational	-	-	0	0	0	0
School	-	-	0	0	0	0

Source: Appendix D.
Notes: Noncancer hazard risk threshold is 1.0 for both Acute and Chronic Hazards. Modeled noncancer hazard risks were rounded to the nearest one decimal place.

2035 Conclusion

Implementation of the proposed Plan would not expose existing sensitive receptors, but would expose new receptors, to substantial concentrations of TAC emissions. Therefore, this impact is significant in 2035.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Criterion 1: Does the proposed Plan result in increases in cancer risk to sensitive receptors over baseline (2016) conditions that exceed 10 in 1 million?

Table 4.3-23 summarizes health effects in 2050 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental risk at the maximally exposed receptors is below 2016 conditions. There are no existing residential, park, or school receptors near existing emission sources that show an increase in cancer risk in 2050. Therefore, the impact on existing sensitive receptors near existing emission sources is less than significant.

For sensitive receptors near new emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due almost exclusively to the new commuter rail lines. The maximally exposed areas are within the El Cajon and Downtown domains, with residential receptor exceedances in each

modeling domain. Risk exceeds the 10 in 1 million threshold in a number of locations due to new rail activity. Therefore, the impact on sensitive receptors near new emission sources is significant.

For new sensitive receptors in new land uses, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due siting of new residential uses near existing rail and roadway sources. The maximally exposed areas are within the Downtown, El Cajon, and Escondido domains. Risk exceeds the 10 in 1 million threshold in a number of locations due to the siting of new land uses. Therefore, the impact on new sensitive receptors in new land uses is significant

Sensitive receptors exposed to new emission sources and new sensitive receptors that show an incremental increase in cancer risk above thresholds in 2050 are shown in Figure 4.3-7.

Table 4.3-23
Summary of Cancer Health Risk 2050

Receptor Type	2016		2050	
	Maximum Cancer Risk (per million)	Area of Threshold Exceedance (acres)	Maximum Incremental Cancer Risk (per million)	Incremental Area of Threshold Exceedance (acres)
Existing Sources				
Residential	447	7,563	-5	0
Recreational	13	25	0	0
School	11	2	0	0
New Sources				
Residential	--	--	131	2,481
Recreational	--	--	3	0
School	--	--	1	0
New Land Uses				
Residential	--	--	133	1,223
Recreational	--	--	0	0
School	--	--	0	0

Source: Appendix D.
Notes: Cancer risk threshold is 10 in 1 million. Modeled cancer risks were rounded to the nearest whole number.

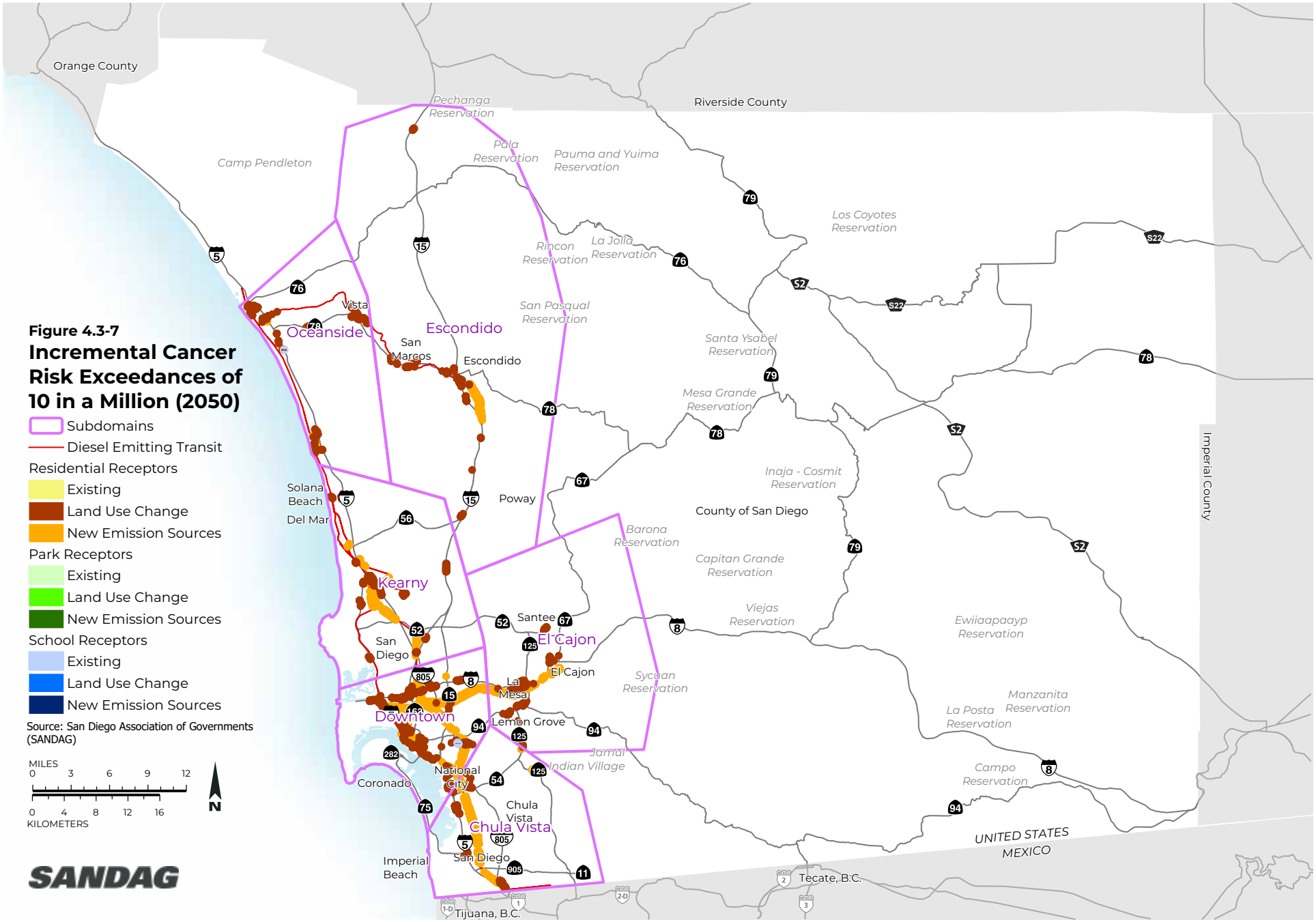


Figure 4.3-7

Incremental Cancer Risk Exceedances of 10 in a Million (2050)

- Subdomains
- Diesel Emitting Transit

Residential Receptors
- Existing
- Land Use Change
- New Emission Sources

Park Receptors
- Existing
- Land Use Change
- New Emission Sources

School Receptors
- Existing
- Land Use Change
- New Emission Sources

Source: San Diego Association of Governments (SANDAG)

MILES
0 3 6 9 12

0 4 8 12 16
KILOMETERS

N

SANDAG

Criterion 2: Does the proposed Plan expose sensitive receptors to total cancer risks above 100 in one 1 million?

Table 4.3-24 summarizes cumulative health risk at residential receptors in 2050 relative to 2016 conditions. As shown, the maximum cumulative cancer risk and the number of receptors in the modeling exposed to 100 per million health risk would decrease. This reduction in exposure is due in part to regulatory policies that reduce emissions from diesel trains and vehicles and gasoline vehicles due to state and federal programs designed to reduce emissions of TACs and improve fuel efficiency. Thus, reductions in the number of exposed individuals would occur despite the proposed Plan's forecasted increase in the population and housing units within the region.

Table 4.3-24
Summary of Cumulative Health Risk, 2050

Receptor Type	2016		2050		2050 vs. 2016	
	Maximum Cumulative Cancer Risk	Area of Threshold Exceedance (acres)	Maximum Cumulative Cancer Risk	Area of Threshold Exceedance (acres)	Change in Maximum Cumulative Cancer Risk	Change in Area of Threshold Exceedance (acres)
Residential	1,015	7,570	922	7,232	-93	-338

Source: Appendix D.
Note: Modeled cancer risks were rounded to the nearest whole number.

The SCS portion of the proposed Plan includes proposed land use changes, with a focus on development within Mobility Hubs or Smart Growth Opportunity Areas. These Mobility Hubs are proposed for communities with a high concentration of people, destinations, and travel choices where densification is envisioned in the SCS. Many of these proposed land uses are within areas that are near existing pollution sources. Although the proposed Plan would contribute emissions at both the regional and local scale, these increases would not increase existing hazards, when taking into account the reduction of emissions over time due to regulatory policies.

A summary of TAC emissions is shown in Table 4.3-25. As shown, project conditions in 2050 show a decrease in all TAC emissions. Overall, TAC emissions reduce between 74 and 100 percent relative to 2016 conditions. Given this reduction in TACs, the proposed Plan would not increase existing hazards, taking into account the effect of regulatory policies over time. Based on the above analysis, this impact is therefore less than significant.

Table 4.3-25
Summary of Toxic Air Contaminants Tons per Year, 2050

Year	Butadiene1,3	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	Naphthalene	PAH	DPM
2016	0.0230	0.1100	0.0120	0.2600	0.1200	0.2200	0.0230	0.0001	0.5300
2050	0.0001	0.0240	0.0018	0.0680	0.0250	0.0520	0.0042	0.00002	0.0710
Change vs. 2016	-100%	-78%	-85%	-74%	-79%	-76%	-82%	-76%	-87%

Source: Appendix D.
Notes: Some values have been rounded to the nearest ten thousandths or hundred thousandths.

Criterion 3: Does the proposed Plan result in increases in health risks to sensitive receptors for noncancer hazards as measured by a THI above 1.0?

Table 4.3-26 summarizes non-cancer health effects in 2050 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental non-cancer risk at the maximally exposed sensitive receptors is below 2016 conditions. For all residential, park, or school sensitive receptors near existing roadway and rail sources, there are no sensitive receptors that show an increase in chronic hazard or acute hazard in 2050 relative to 2016 conditions. Therefore, the impact on sensitive receptors near existing emission sources is less than significant.

For sensitive receptors that would be exposed to new emission sources, the incremental risk at the maximally exposed sensitive receptors far exceeds both the chronic and acute threshold at residential and recreational receptors. The maximally exposed areas are within the El Cajon, Downtown, and Chula Vista domains, with increases in all domains above the threshold. Non-cancer chronic and acute risk at various residential and recreational receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on sensitive receptors near new emission sources is significant.

For new sensitive receptors in new land uses that would be exposed to existing emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds both the acute and the chronic threshold at residential uses. The maximally exposed area for acute hazard is within the Chula Vista domain. The maximally exposed area for chronic hazard is within the El Cajon domain, with exceedances in each domain. Non-cancer chronic risk at various residential receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on new sensitive receptors in new land uses is significant

Table 4.3-26
Summary of Noncancer Hazards, 2050

Receptor Type	2016 Maximum Hazard Index		Maximum Incremental Change vs. 2016		Incremental Area of Threshold Exceedance (acres)	
	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard
Existing Sources						
Residential	6.9	52.9	0.5	-0.6	0	0
Recreational	2.3	37	0.2	-0.9	0	0
School	1.5	24.9	0	0	0	0
New Sources						
Residential	--	--	0.9	13.8	0	2,477
Recreational	--	--	0.6	4.3	0	299
School	--	--	0.2	2.2	0	1
New Land Uses						
Residential	--	--	1.5	11.2	2	1,218
Recreational	--	--	0	0	0	0
School	--	--	0	0	0	0

Source: Appendix D.
Notes: Noncancer hazard risk threshold is 1.0 for both Acute and Chronic Hazards. Modeled noncancer hazard risks were rounded to the nearest one decimal place.

2050 Conclusion

Implementation of the proposed Plan would not expose existing sensitive receptors, but would expose new receptors, to substantial concentrations of TAC emissions. Therefore, this impact is significant in 2050.

Exacerbation of Climate Change Effects

The proposed Plan could potentially exacerbate climate change effects on exposing sensitive receptors to substantial TAC concentrations. Climate change could increase exposure to some carcinogens, such as through particulate matter from wildfire and flooding inundation of chemical or waste sites that may release carcinogens (Nogueira, Yabroff, and Bernstein 2020).

MITIGATION MEASURES

AQ-5 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL TAC CONCENTRATIONS

2025, 2035, and 2050

Implement mitigation measure **AQ-2a**, as discussed under Impact AQ-2. Mitigation measure **AQ-2a** would reduce road dust from freeway travel, which is the primary cause of the PM10 exceedances discussed herein.

Implement mitigation measure **AQ-4**, as discussed under Impact AQ-4. Mitigation measure **AQ-4** would reduce pollution exposure at land uses near emission sources. These design measures would also reduce TACs by reducing exposure to all roadway and rail pollution.

The following mitigation measures, as discussed in Section 4.8, will further reduce TAC emissions:

- **GHG-5a. Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans**
- **GHG-5b. Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure**
- **GHG-5d. Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide**
- **GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects**

The following mitigation measures presented in Section 4.16 will further reduce TAC emissions by reducing VMT:

- **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects.**

In addition, the following measures are proposed:

AQ-5a Reduce Exposure to Localized Toxic Air Contaminant Emissions. During planning, design, and project-level CEQA review of transportation network improvements and programs, SANDAG shall, and other transportation project sponsors can and should, evaluate the potential toxic air contaminant (TAC) impacts of the project using applicable procedures and guidelines for such analyses (for example, California Air Pollution Control Officers' Association, OEHHA, and/or EPA air toxics health risk assessment guidance).

In addition, during planning, design, and project-level CEQA review of development projects, the County of San Diego, cities, and other local jurisdictions can and should apply the above measures, and additional measures to reduce TAC emissions or exposure to TAC emissions, including but not limited to:

- Reduce the potential for TACs to be introduced into buildings by all of the following:
    - Maintaining a positive air pressure within buildings that include sensitive receptors.
    - Achieving a performance standard of at least one air exchange per hour of fresh outside filtered air.
    - Achieving a performance standard of at least 4 air exchanges per hour of recirculation.
    - Achieving a performance standard of at least 0.25 air exchanges per hour of unfiltered air if the building is not positively pressurized.
- Within developments, separate sensitive receptors from truck activity areas, such as loading docks and delivery areas. This measure would reduce exposure of residents and other sensitive receptors by locating sources of TACs associated with loading docks and delivery areas away from sensitive receptors.
- Replace or retrofit existing diesel generators that are not equipped to meet CARB's Tier 4 emission standards.
- Reduce emissions from diesel trucks using the project site through the following measures:
    - Install electrical hook-ups for electric or hybrid trucks at loading docks.
    - Require trucks to use Transportation Refrigeration Units (TRUs) that meet Tier 4 emission standards.
    - Require truck-intensive projects to use advanced exhaust technology (e.g., hybrid) or alternative fuels.
    - Prohibit trucks from idling for more than 2 minutes as feasible.

This measure would reduce emissions of TACs from trucks and TRUs by reducing operations and requiring them to use electrical hookups.

- Do not locate sensitive receptors in the same buildings as a perchloroethylene dry cleaning facility. This measure would reduce potential exposure of sensitive receptors to perchloroethylene from dry cleaning facilities.
- Maintain a 50-foot buffer from a typical gas dispensing facility (under 3.6 million gallons of gas per year). This measure would reduce potential exposure of sensitive receptors to emissions from gas stations.
- Ensure that private (individual and common) exterior open space, including playgrounds, patios, and decks, is shielded from stationary sources of air pollution by buildings or otherwise buffered to further reduce air pollution exposure for project occupants. This measure would reduce the potential for exposure of residents and other sensitive populations to stationary sources of TAC emissions.

AQ-5b. Reduce Exposure to Localized Toxic Air Contaminant Emissions during Railway Design. In order to help reduce localized toxic air contaminant (TAC) concentrations at sensitive receptors near the future proposed railway(s), SANDAG shall require the design of railway tunnels or other approaches to move emissions underground, where feasible, during individual project-level design. Furthermore, individual project-level design of railway tunnels or other underground features shall require that portals, adits, windows, and other venting features are located as far away as feasibly possible from nearby sensitive receptor(s).

SIGNIFICANCE AFTER MITIGATION

2025, 2035, 2050

Mitigation Measure AQ-2, as described under Impact AQ-2, which will help secure incentive funding to reduce PM emissions from mobile sources. Mitigation Measure AQ-5a will reduce TAC emissions and TAC emission exposure on existing and new receptors through design and siting requirements. Mitigation Measure AQ-5b will reduce diesel emission exposure on existing and new receptors through undergrounding and design.

Mitigation measures GHG-5a, GHG-5b, GHG-5d, and GHG-5f would reduce PM10 and PM2.5 emissions from tire wear, brake wear, and vehicle exhaust, as discussed in Section 4.8. In addition, mitigation measure TRA-2 would reduce criteria pollutants through project-level VMT reduction measures, as discussed in Section 4.16. Measures to reduce VMT or vehicle exhaust (e.g., EVs) in these mitigation measures would reduce TAC emissions and associated concentrations.

Although mitigation would reduce impacts, there is no guarantee that impacts would be reduced to below a level of significance for every project. Thus, this impact would be significant and unavoidable.

AQ-6 EXPOSE SENSITIVE RECEPTORS TO CARBON MONOXIDE HOT-SPOTS

ANALYSIS METHODOLOGY

This analysis addresses the exposure of sensitive receptors to substantial concentrations of CO. A CO hot spot is a localized concentration of CO, typically found at congested intersections, that is above the state or national 1-hour or 8-hour ambient air standards for the pollutant. Projects that do not generate CO concentrations in excess of the health-based NAAQS or CAAQS would not contribute a significant level of CO such that localized air quality and human health would be substantially affected.

This analysis qualitatively evaluates proposed Plan CO concentration impacts, including CO hot spots, by comparing them to CO concentrations disclosed in the 2015 Regional Plan EIR.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Vehicle travel under the proposed Plan is projected to decrease by approximately 4,000,000 VMT daily compared to 2025 projections under the 2015 Regional Plan (see Section 4.16). Proposed transportation infrastructure and programs within the proposed Plan would help to reduce VMT by providing alternative forms of transportation, including biking, walking, and transit, which would reduce passenger car travel and thereby reduce any exposure to emissions at congested roadways. VMT and overall vehicle use would be lower than assumed in the 2015 Regional Plan.

The 2015 Regional Plan EIR analyzed CO concentrations at four congested intersections and found impacts to be well below significance thresholds, even for the existing year 2012. CO emissions would be even lower under the proposed Plan due to reduced traffic volumes and cleaner engine technology, as compared to what was modeled in the 2015 Regional Plan EIR. Thus, CO concentrations would be lower and continue to be well below significance thresholds. The proposed Plan's CO concentration impacts would also be lower than the 2015 Regional Plan's impacts because background CO concentrations are lower today than what was assumed in the 2015 Regional Plan EIR. In the 2015 Regional Plan EIR analysis, modeled concentrations were added to background concentrations to evaluate Plan conditions against 1-hour or 8-hour ambient air standards. The 2015 Regional Plan EIR used a 1-hour background of 4.4 ppm and an 8-hour background of 3.8 ppm. Over the most recent 5-year period, data from the EPA (see Table 4.3-3) has the maximum 1-hour background at 4.1 ppm and the 8-hour background at 2.5 ppm. These background concentrations are lower than assumed in the 2015 Regional Plan EIR.

2025 Conclusion

Implementation of the proposed Plan would not expose sensitive receptors to substantial concentrations of CO in 2025. This impact is less than significant.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Vehicle travel under the proposed Plan is would decrease by approximately 8,500,000 VMT daily compared to the 2035 projections under the 2015 Regional Plan (see Section 4.16). Proposed transportation infrastructure and programs within the proposed Plan would help to reduce VMT by providing alternative forms of transportation, including biking, walking, and transit, which would reduce passenger car travel and thereby reduce any exposure to emissions at congested roadways. VMT and overall vehicle use would be lower than assumed in the 2015 Regional Plan.

The 2015 Regional Plan EIR and proposed Plan both modeled CO emissions for the year 2035. According to the 2015 Regional Plan EIR, on-road vehicle sources would be responsible for 71.26 tons per day of CO emissions (2015 Regional Plan EIR Table 4.3-12). As shown in Table 4.3-7, the proposed Plan would emit 53.40 tons per day of CO from on-road vehicle sources. Compared to the 2015 Regional Plan EIR, the proposed Plan would

emit approximately 17.86 tons per day less of CO emissions, or 26 percent less than the 2015 Regional Plan EIR. According to the 2015 Regional Plan EIR, the implementation of the 2015 Regional Plan would not induce a CO hotspot at four congested intersections for the year 2035. Thus, as the 2015 Regional Plan EIR did not have a CO hot spot impact and modeled higher CO emissions from on-road sources (26 percent more) compared to the proposed Plan, the proposed Plan would also not have a CO hot spot impact.

2035 Conclusion

Implementation of the proposed Plan would not expose sensitive receptors to substantial concentrations of CO in 2035. This impact is less than significant.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Vehicle travel under the proposed Plan is assumed to decrease by approximately 10,700,000 VMT daily compared to 2050 projections under the 2015 Regional Plan (see Section 4.16). Proposed transportation infrastructure and programs within the proposed Plan would help to reduce VMT by providing alternative forms of transportation, including biking, walking, and transit, which would reduce passenger car travel and thereby reduce any exposure to emissions at congested roadways. VMT and overall vehicle use would be lower than assumed in the 2015 Regional Plan.

The 2015 Regional Plan EIR modeled that on-road vehicle sources CO emissions would be approximately 65.08 tons per day (2015 Regional Plan EIR Table 4.3-16). Furthermore, the 2015 Regional Plan EIR analyzed CO concentrations at four congested intersections and found impacts to be well below significance thresholds for the year 2050. According to Table 4.3-7, on-road sources within the proposed Plan would emit approximately 51.08 tons per day of CO. This would be 14 tons per day less than what was analyzed within the 2015 Regional Plan EIR. Thus, as the 2015 Regional Plan EIR did not find a CO hotspot at four congested intersections while assuming higher on-road source CO emissions, the proposed Plan would also not create any CO hotspots.

2050 Conclusion

Implementation of the proposed Plan would not expose sensitive receptors to substantial concentrations of CO in 2050. This impact is less than significant.

Exacerbation of Climate Change Effects

The proposed Plan would not exacerbate climate change effects on exposing sensitive receptors to substantial concentrations of CO. This impact is less than significant for the proposed Plan and climate change is not expected to worsen CO hotspots, so there is unlikely to be an exacerbation of climate change effects.

AQ-7 RESULT IN OTHER EMISSIONS (SUCH AS THOSE LEADING TO ODORS) ADVERSELY AFFECTING A SUBSTANTIAL NUMBER OF PEOPLE

ANALYSIS METHODOLOGY

The proposed Plan would result in significant impacts if it would result in the emission of odors that causes nuisance to a considerable number of persons or to the public. A project that proposes a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable

number of offsite receptors. Odor sources within the SANDAG region, such as agricultural operations, wastewater treatment facilities, and landfills, are controlled by city and county odor policies enforced by SDAPCD, including SDAPCD Rule 51, which prohibit nuisance odors and identify enforcement measures to reduce odor impacts on nearby receptors.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, population within the region is projected to increase by 161,338 people, housing by 97,661 units, and employment by 115,328 jobs. Construction of land use development projects could release odors from offroad equipment. Sources of odors from operational activities would include agricultural activities, wastewater treatment plants, food processing plants, chemical plants, composting facilities, landfills, dairies, and fiberglass molding. The regional growth and land use change for 2025 in the proposed Plan does not result in major increases in industrial areas that are likely to include these types of land uses. Activities that would have the potential to result in nuisance odors would be required to comply with applicable odor regulations, including SDAPCD Rule 51, that prevent impacts from being significant.

Therefore, regional growth and land use change projects in 2025 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

Transportation Network Improvements and Programs

Transportation network improvements proposed in 2025 include commuter rail, several rapid bus lines, zero-emission bus upgrades, I-15 Managed Lanes, and several bikeway and bike facility improvements. Transportation network improvements would be required to comply with applicable odor regulations, including Rule 51, that prevent impacts from being significant. Therefore, transportation network improvements and programs in 2025 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

2025 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to odor impacts because both development projects and transportation network improvements would be required to comply with applicable odor regulations that prevent impacts from being significant. Odors from these projects would not cause nuisance to a considerable number of persons or to the public, when compared to existing conditions; therefore, this impact (AQ-7) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change

From 2016 to 2035, population within the region is expected to increase by 310,838 people, housing by 219,311 units, and employment by 275,056 jobs. Construction of land use development projects could release odors from offroad equipment. Sources of odors from operational activities would include agricultural activities, wastewater treatment plants, food processing plants, chemical plants, composting facilities, landfills, dairies, and fiberglass molding. The regional growth and land use change for 2035 in the proposed Plan does

not result in major increases in industrial areas that are likely to include these types of land uses. Activities that would have the potential to result in nuisance odors would be required to comply with applicable odor regulations, including SDAPCD Rule 51, that prevent impacts from being significant.

Therefore, regional growth and land use change projects in 2035 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

Transportation Network Improvements and Programs

Transportation network improvements proposed in 2035 include additional commuter rail, ferry services, improvements to light rail, the San Ysidro Mobility Hub, the Central Mobility Hub, and the airport people mover. Transportation network improvements would be required to comply with applicable odor regulations, including Rule 51, that prevent impacts from being significant. Therefore, transportation network improvements and programs in 2035 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

2035 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to odor impacts because both development projects and transportation network improvements would be required to comply with applicable odor regulations that prevent impacts from being significant. Odors from these projects would not cause nuisance to a considerable number of persons or to the public when compared to existing conditions; therefore, this impact (AQ-7) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change

From 2016 to 2050, population within the region is projected to increase by 436,563 people, housing by 280,744 units, and employment by 439,899 jobs. Construction of land use development projects release odors from offroad equipment. Sources of odors from operational activities would include agricultural activities, wastewater treatment plants, food processing plants, chemical plants, composting facilities, landfills, dairies, and fiberglass molding. The regional growth and land use change for 2050 in the proposed Plan does not result in major increases in industrial areas that are likely to include these types of land uses. Activities that would have the potential to result in nuisance odors would be required to comply with applicable odor regulations, including SDAPCD Rule 51, that prevent impacts from being significant.

Therefore, regional growth and land use change projects in 2050 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

Transportation Network Improvements and Programs

Transportation network improvements proposed in 2050 include additional commuter rail, a tram, additional Rapid bus improvements, and bikeway improvements. Transportation network improvements would be required to comply with applicable odor regulations, including Rule 51, that prevent impacts from being significant. Therefore, transportation network improvements and programs in 2050 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

2050 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to odor impacts because both development projects and transportation network improvements would be required to comply with applicable odor regulations that prevent impacts from being significant. Odors from these projects would not cause nuisance to a considerable number of persons or to the public, when compared to existing conditions; therefore, this impact (AQ-7) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change impacts in the San Diego region that could resulting in emissions leading to increased odors as described in Section 4.3.1, the proposed Plan would not exacerbate climate change effects on increased odors assuming land use and transportation projects implementing the proposed Plan comply with odor regulations.

4.4 BIOLOGICAL RESOURCES

This section evaluates the biological resources impacts of the proposed Plan. Appendix E of this EIR provides more detail on the data sources and analysis background.

4.4.1 EXISTING CONDITIONS

The following section describes the existing biological resources within the San Diego region, including sensitive vegetation communities, federally and State regulated waters and wetlands, special-status species, and wildlife movement.

SENSITIVE VEGETATION COMMUNITIES

Sensitive vegetation communities considered in this EIR are those regulated, protected, or designated as sensitive by any federal, state, or local agency, plan, policy, regulation, or ordinance (see Section 4.4.2, *Regulatory Setting*). Furthermore, sensitive vegetation communities are considered rare within the San Diego region and support habitat for listed or special-status species. Sensitive vegetation communities also include riparian and wetland vegetation communities that are associated with State and federally regulated aquatic resources (in this document, *aquatic resources* generally refers to regulated waters and wetlands, including Section 404 of the Clean Water Act (CWA), California Coastal Act (CCA), the Porter-Cologne Act, Water Quality Control Act, and California Fish and Game Code (CFGC) Sections 1600 et seq.

The following agencies and entities identify sensitive vegetation communities in their policies, plans, and programs: California Coastal Commission (CCC); U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) (through the California Natural Diversity Database [CNDDB] and NatureServe Standard Heritage Program methodology [NatureServe 2021]); California Native Plant Society (CNPS); the County of San Diego, and cities in the San Diego region that participate in various Natural Community Conservation Planning (NCCPs) programs, specifically the Multiple Species Conservation Program (MSCP) and the Multiple Habitat Conservation Program (MHCP). The U.S. Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB) regulate aquatic resources, and while this does not include specific vegetation communities, regulated aquatic resources are often associated with wetland and riparian vegetation communities.

Sensitive vegetation communities that occur anywhere in San Diego County are included in the inventory and analysis in this EIR. The County of San Diego and cities of San Diego, Chula Vista, Encinitas, Carlsbad, Oceanside, Poway, and Escondido identify sensitive vegetation communities in their ordinances and guidelines. Specifically, the County of San Diego regulates sensitive vegetation communities through the Biological Mitigation Ordinance (BMO) for those areas covered by the County's MSCP Subarea Plan, and the Resource Protection Ordinance (RPO) for those areas not covered by the County's MSCP; County of San Diego Guidelines for Determining Significance for Biological Resources (County of San Diego 2010); and Habitat Loss Permit (HLP) ordinance (see Section 4.4.2). The cities of San Diego, Chula Vista and Carlsbad also developed specific guidelines pursuant to their NCCP Subarea Plan, including the City of San Diego's Land Management Code Environmentally Sensitive Lands (ESL) and Biology Guidelines, and the City of Carlsbad's Biological Studies, Habitat Restoration, Preserve Management, and Riparian and Wetlands Buffer Guidelines. In addition, the City of San Diego regulates vernal pools through the Vernal Pool Habitat Conservation Plan (VPHCP, City of San Diego 2017).

For the purpose of this EIR and as identified in the guidelines, plans, and policies listed above, riparian, wetland, and certain upland vegetation communities identified in Table 4.4-1 are considered sensitive, specifically those that are regulated as classified by the NCCP "tier" system. Upland vegetation communities identified as sensitive in the San Diego County NCCPs (including the MHCP and MSCP) are divided into tiers of biological sensitivity based on rarity and ecological importance. Tier I represents the most sensitive (rarest or subject to threats) communities, while Tier IV represents the least sensitive communities. Other cover types—such as agriculture, disturbed habitat (i.e., areas that have been physically disturbed[1] and no longer contain recognizable native or naturalized vegetation communities), eucalyptus woodland and other ornamental or nonnative vegetation, and urban/developed—are not considered sensitive (Table 4.4-1). Disturbed habitat, together with native and nonnative grassland, is considered habitat for the western burrowing owl (*Athene cunicularia*), a CDFW-listed species of special concern and covered species under several NCCPs, and suitable burrowing owl habitat will require mitigation if impacted.

Table 4.4-1
Existing Vegetation Communities and Land Cover Types Within the San Diego Region

Vegetation Community	Acres[1]	Percent of Total in San Diego County
Riparian and Wetlands		
Beach/Coastal Dunes/Saltpan/Mudflats	1,840	0.1
Marsh	8,172	0.3
Meadows and Seeps	12,648.50	0.5
Open Water and Streams	15,764.50	0.6
Riparian Forest/Woodland	53,726	2.0
Riparian Scrub	17,448	0.6
Vernal Pools[2]	459.50	0.02
Riparian and Wetlands Total	110,058.50	4.1
Uplands		
Chaparral	852,540	31.4
Coastal Scrub	287,980	10.6
Desert Dunes	46,661	1.7
Desert Scrub	465,764	17.2
Oak Woodlands	119,552	4.4
Forest/Woodland	134,357	5.0
Grasslands	146,500	5.4
Uplands Total	**2,053,354**	**75.7**
Other Cover Types		
Agriculture	136,748	5.0
Disturbed Habitat	28,692.50	1.1
Urban/Developed	383,220	14.1
Other Cover Types Total	**548,660.50**	**20.2**

[1] While disturbed habitat is not considered sensitive it might provide habitat for such sensitive species as the western burrowing owl.

Vegetation Community	Acres[1]	Percent of Total in San Diego County
Grand Total	**2,712,073**	**100.0**

Source: County of San Diego 2021c~~17~~.
[1] Groups are based on physiognomic, ecologic, and geographic criteria, such that groups contain vegetation types of similar structure and ecological function. These groups are not defined in the Holland and/or 2015 vegetation classification systems. Appendix E-1 lists the detailed vegetation communities within each aggregated group.
[2] 2003–2011 vernal pool mapping available from the City of San Diego VPHCP (City of San Diego 2017).

Vegetation Mapping Data Sources and Methods

The description of existing conditions for vegetation communities in the San Diego region is based on a compilation of regionally collected vegetation data, which are aggregated in a geographic information system (GIS) data layer of Existing Vegetation and administered by the County of San Diego (County of San Diego et al. 2021~~17~~). This data set covers the entire San Diego region and uses the modified Holland classification system (Holland 1986, Oberbauer et al. 2008). The data were collected mostly for the development of the MSCP and MHCP, and have been modified and updated over the years from a variety of sources and catalogued by SANDAG and the County of San Diego; the most recent update reflected in this EIR is from 2021~~17~~ (County of San Diego et al. 2021).

The 2021~~17~~ data are combined and collapsed into 17 vegetation groups that are created specifically for this EIR in an effort to streamline the programmatic analysis of the vegetation communities. The groups contain vegetation communities of similar regulatory importance, sensitivity, structure, and ecologic function, and are based on physiognomic (appearance or outward features), ecologic, and geographic criteria. The region's vegetation communities are combined into the 17 vegetation groups in three categories: Riparian and Wetlands (7 groups); Uplands (7 groups); and Other Cover Types (3 groups) (Table 4.4-1). The data sources and analytic techniques described below provide a reasonably accurate description of existing conditions for vegetation and land cover, including sensitive vegetation communities, for the purpose of a programmatic large-scale analysis such as required for the Regional Plan EIR (rather than based on site-specific or project-specific data). Appendix E-1, includes a rationale for the 2021~~17~~ vegetation classification into the 17 vegetation groups identified in Table 4.4-1.

The County of San Diego 2021~~17~~ vegetation data (County of San Diego et al. 2021~~17~~) were used as the basis to determine existing vegetation communities occurring within the entire Plan Area. After aggregating the data into one of the 17 vegetation groups described above, the data were overlaid with the land use layer to identify areas that changed in land cover from a vegetation group to urban/developed or agricultural land cover between 2011 and 2021~~17~~. Areas that became urban/developed or agricultural land cover were recoded as those designations in the vegetation data layer prepared for this EIR.

Post-Fire Vegetation

Most common vegetation communities in the San Diego region generally persist unless development and land use pressures, invasion by exotic species, or wildfire cause changes (Barbour et al. 2007, Diffendorfer et al. 2002). Fire recovery in certain vegetation types may require decades (Witter et al. 2007), and some vegetation types recover more readily (e.g., chaparral) than others (e.g., coastal sage scrub) (Witter et al. 2007, Meng et al. 2014). It is generally assumed, and supported by the literature, that the post-fire response of San Diego region vegetation communities such as chaparral is to eventually return to their pre-fire communities; however, most sensitive native vegetation communities (e.g., coastal sage scrub, maritime succulent scrub, vernal pools, and chaparral dominated by self-seeding plants [versus re-sprouting plants]) are assumed to convert to a degraded

condition or nonnative habitat ("type-convert"). Burned habitats within the western one-third of the San Diego region may be prone to increased edge effects and human encroachment and therefore have an increased chance to type-convert to a degraded condition. Vegetation recovery post-wildfires are not often mapped or they are mapped on a small scale related to project-specific mapping efforts.

The existing conditions in this EIR assume that all vegetation communities available in the 2021~~17~~ County data set are identified either as their pre-fire condition or existing condition, depending on the data sources. Some of the vegetation communities affected by fires may have recovered since the fires. However, there is evidence that many sensitive vegetation communities subject to wildfire did not return to their mapped pre-fire condition (i.e., they converted to a degraded or nonnative condition). Therefore, this approach may overestimate the impacts of the proposed Plan on sensitive vegetation communities.

Physiographic Subregions

The 17 vegetation communities identified for this EIR occur within three physiographic subregions: Southern California Coast, Southern California Mountains and Valleys, and Colorado Desert (McNab et al. 2005). The subregions are characterized as follows:

Southern California Coast Subregion

The Southern California Coast subregion occurs at elevations ranging from sea level to 2,900 feet above mean sea level (AMSL). It encompasses that area along the immediate coastline of the Pacific Ocean as well as the more easterly mesa and interior foothills (approximately the western third of the San Diego region). Brush and scrub communities such as chaparral and coastal scrub are the most common upland habitats found in this subregion, with chaparral the most widespread (Figure 4.4-1). Nonnative grasslands are widely distributed (often as a result of disturbance or type conversion), whereas native grasslands are a relatively rare occurrence. Riparian woodlands occur throughout the subregion and are predominantly distributed in a linear pattern along rivers and streams. Marshes and wetlands are associated with estuaries but also occur in valleys or along riparian corridors. In addition, this region also includes the unique vegetation community of vernal pools. (Figure 4.4-1).

Vegetation communities characterized by a high level of constituent sensitive species occurring in the coastal subregion include southern foredunes, southern coastal bluff scrub, maritime succulent scrub, Diegan coastal sage scrub, southern maritime chaparral, native grassland, San Diego mesa hardpan/claypan vernal pools, southern coastal salt marsh, coastal brackish marsh, coastal freshwater marsh, riparian woodlands and scrubs, coast live oak woodland, Engelmann oak woodland, and Torrey pine forest. These communities provide habitat for a diversity of sensitive plant and animal species.

Southern California Mountains and Valleys

The Southern California Mountains and Valleys subregion occurs at elevations ranging from 100 to 6,500 feet AMSL and includes the major mountain systems of the peninsular range that occur in the San Diego region: San Ysidro, Cuyamaca, Volcan, Laguna, and Vallecitos (approximately the central third of the San Diego region). Vegetation communities that occur in this montane subregion overlap with the chaparral, scrub, riparian, and woodland communities of the coastal subregion; however, others are unique to the mountains (Figure 4.4-1). These include coniferous woodlands, black oak woodlands, and montane meadows. All of these vegetation communities provide habitat for various plant and animal species, and, although fewer than those found in the coastal subregion, sensitive species are well represented.

Colorado Desert Subregion

The Colorado Desert subregion is found to the east of the montane subregion at elevations ranging from sea level to 3,400 feet AMSL (approximately the eastern third of the San Diego region). The vegetation communities present in the Colorado Desert subregion are quite distinct from those found within the Coastal and Mountains and Valleys subregions. The majority are desert scrub communities, of which creosote bush scrub is dominant (Figure 4.4-1). This vegetation community is also the second most common vegetation type in the San Diego region. A number of sensitive plant and animal species are also found within these vegetation communities.

Existing Vegetation Communities

This section describes the 17 existing vegetation community groups in the San Diego region derived from the data sets indicated above.

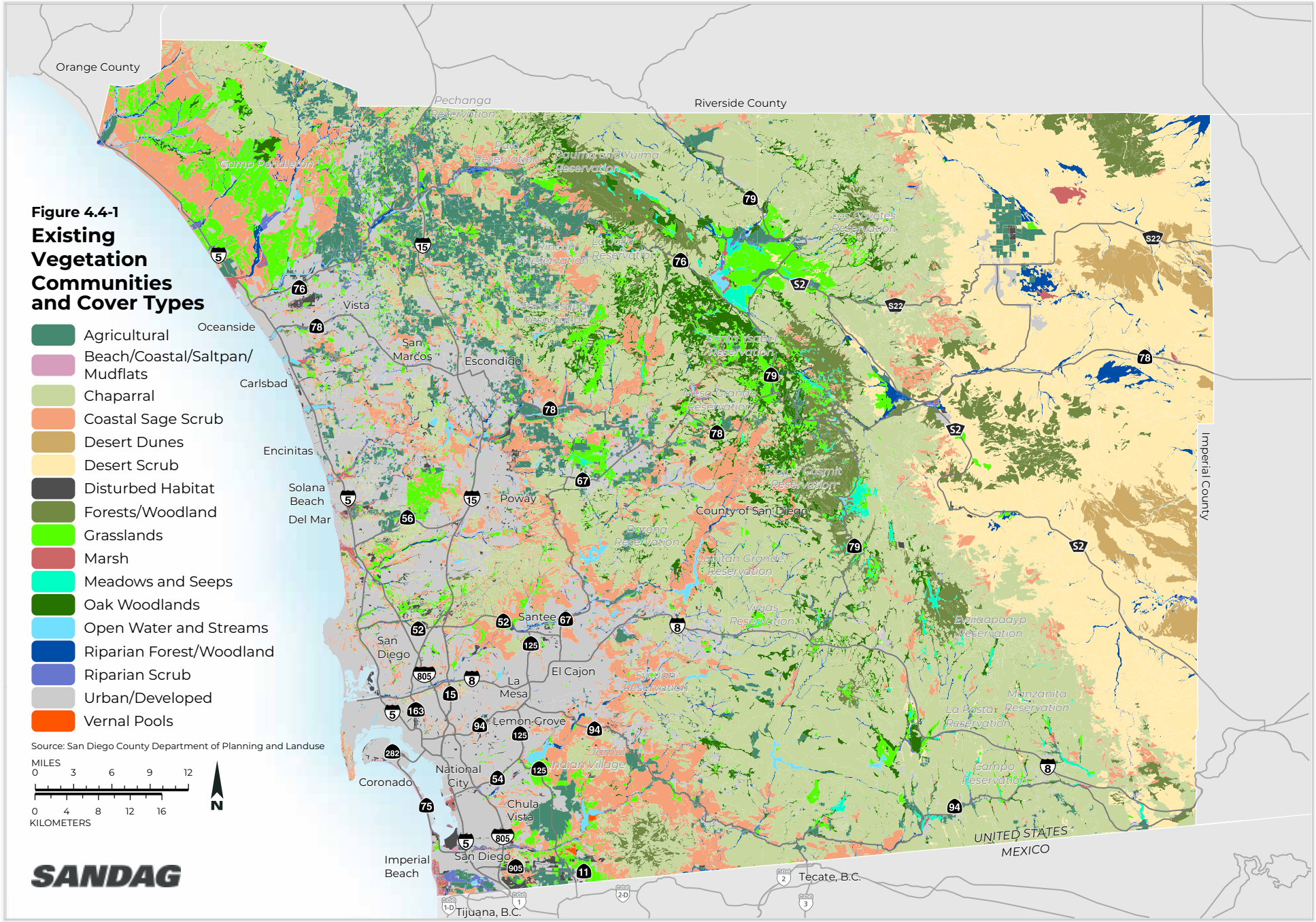


Figure 4.4-1
Existing Vegetation Communities and Cover Types
Agricultural
Beach/Coastal/Saltpan/ Mudflats
Chaparral
Coastal Sage Scrub
Desert Dunes
Desert Scrub
Disturbed Habitat
Forests/Woodland
Grasslands
Marsh
Meadows and Seeps
Oak Woodlands
Open Water and Streams
Riparian Forest/Woodland
Riparian Scrub
Urban/Developed
Vernal Pools
Source: San Diego County Department of Planning and Landuse
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
Pechanga Reservation
Camp Pendleton
Cahuilla Reservation
Quechan and Yuma Reservation
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
Pala Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Morongo Reservation
Cabazon Reservation
Viejas Reservation
Barona Reservation
Capitan Grande Reservation
Sycuan Reservation
Jamul Indian Village
Ewiiaapaayp Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.

Riparian and Wetland Vegetation Communities

Riparian and wetland habitats support vegetation adapted to the periodic presence of or saturation by surface or ground water; therefore, they are relatively rare in the semi-arid climate of Southern California. Riparian and wetland habitats are considered sensitive due to extensive historic losses of wetlands nationwide, their ability to improve and maintain the quality of potable water sources, and their value as habitat for sensitive species and wildlife movement. It is estimated that over half of wetland habitats have been lost in the conterminous United States (SWRCB 2019).

In California, at least 90 percent of wetland habitat has been destroyed (SWRCB 2019). In Southern California, an estimated 90 to 95 percent of riparian wetlands and over 70 percent of coastal wetlands have been lost (CCC 1994, Faber et al. 1989), and over 97 percent of vernal pool habitat has been lost in the San Diego region (Bauder and McMillan 1986, Oberbauer and Vanderwier 1991, Keeler-Wolf et al. 1995).

Of the vegetated habitats, riparian/forest woodland is the largest expanse of riparian/wetland habitat types, followed by riparian scrub, open water and streams, meadows and seeps, and marsh (including coastal salt marsh). Vernal pools are isolated ephemeral depressions surrounded by upland habitat and form a unique vegetation community containing many special-status and endemic species, but cover less than 500 acres of land cover in San Diego County. Open water is ecologically highly productive and includes lakes, reservoirs, estuaries, and the fringes of these types of open water habitats. Open water, riparian woodland, and riparian scrub comprise 79 percent (i.e., 86,937.70 acres out of a total of110,057.20 acres) of all riparian and wetland vegetation communities (Table 4.4-1).

Riparian ecosystem's highly productive vegetation and ability to buffer the effects of organic nutrients and toxins provide habitat to support a high diversity of species (Peck 1993). Plant density, composition, age structure, and cover within and adjacent to riparian woodlands and forests affect habitat diversity (which may be measured by the degree of vertical and horizontal habitat structure, density, and species richness). Riparian woodlands and forests are composed of several vertical layers, including canopy, shrub, herb, and ground. This complex habitat structure is often positively correlated with wildlife abundance and diversity. In addition, riparian areas usually harbor greater wildlife diversity and abundance than upland areas, and frequently serve as wildlife corridors due to their linear nature and the cover they provide.

Riparian woodland overstory provides valuable roosting, foraging, and breeding areas, while foraging birds and mammals utilize the understory. The trees themselves provide extensive foliage and bark surface for foraging, insectivorous birds. Although overall wildlife diversity is generally greater where vertical vegetation structure is well developed, species-specific occurrence can frequently be linked to the quality or presence of one component of the vertical structure. Riparian and wetlands communities also contribute to the overall soil health and stability, create shade to lower water temperatures and improve water quality for aquatic organisms, return carbon into the soil through detritus and debris deposition, and increase carbon storage and biomass (NRCS 2010). This is particular true for estuarine habitats as a result of deep organic soil deposits that have the ability to sequester relatively large amounts of blue carbon[2] (McTigue et al. 2019, Windham-Myers et al. 2018, Sutton-Grier and Moore 2016). Riparian buffers improve water quality by enhanced infiltration of

[2] Blue carbon refers to carbon dioxide removed from the atmosphere by the world's ocean ecosystems, mostly algae, mangroves, salt marshes, seagrasses and macroalgae, through plant growth and the accumulation and burial of organic matter in the soil.

surface runoff, and increase surface roughness to slow overland flows. Water is more easily absorbed and allows for groundwater recharge. Functional riparian systems have significant potential to reduce the adverse effects of climate change by enhancing ecosystem resilience (Seavy et al. 2009).

The majority of riparian and wetland communities contain native species, although disturbed wetlands are usually dominated by introduced species; for example, giant reed (*Arundo donax*) is a highly invasive nonnative species that is often found in and along rivers and streams in association with southern willow scrub, but may also occur along the upper terraces of valleys and canyons intermixed with upland habitat or in monocultural stands.

Upland Vegetation Communities

Southern California is an international biodiversity hotspot due to its varied topography and associated vegetation belts and biomes, and its Mediterranean climate (Dobson et al. 1997, Jennings et al. 2018, Stein et al. 2000). The San Diego region is characterized by a unique mosaic of upland scrub and grassland habitats, many of which are considered sensitive because they provide valuable nesting, breeding, and/or foraging habitat for many special-status wildlife species, including narrow endemic species that occur nowhere else in the world. San Diego County's upland habitats are dominated by chaparral (852,539.70 acres), desert scrub (465,764.30), and coastal sage scrub (287,980.20), comprising 78 percent (i.e., 1,606,284.20 acres out of a total of 2,053,353.90 acres) of all upland vegetation communities (Table 4.4-1).

Unlike riparian corridors, which are linear and occur along rivers and streams, upland habitats typically form a large matrix and provide a broad variety of species structure and composition. Dense sage scrub vegetation or dense-canopied woodlands provide useful habitat and movement corridors for wildlife, while open grasslands provide foraging habitat for raptors and other predators and can also contain a unique diversity of plant species.

The majority of coastal and inland habitats are dominated by shrublands (such as coastal sage scrub and chaparral), most of which are considered sensitive. Upland vegetation communities with soils that have high clay content are known to support special-status endemic plant species, such as those that occur in association with mafic chaparral and gabbro soils. Clay-adapted coastal sage scrub is associated with the federally threatened California gnatcatcher (*Polioptila californica*), the protection of which spearheaded the development of the California NCCP Act and associated subregional multi-species conservation programs such as the San Diego MSCP and North County MHCP. Impermeable clay soils also provide conditions for many narrow endemic plant species and also form vernal pools (specifically on mesa tops and in valley grasslands), which are unique seasonal wetlands that support the highest number of federally and state-listed and narrow endemic species in the San Diego region. Nonnative grasslands provide habitat for special-status plant and animal species, including foraging habitat for many raptor species.

San Diego's upland scrub communities have evolved with natural fires. Many sensitive upland vegetation communities such as coast live oak woodland and Diegan coastal sage scrub are rapidly declining due to urbanization and climate-change effects, including frequent and short-interval wildfires that lead to type conversion and the effects of invasive pest invasions such as the polyphagous and Kuroshio shot hole borers and the goldspotted oak borer beetles.

Forests and woodlands harbor a great wildlife diversity and contribute significantly to carbon sequestration and storage, specifically those considered old growth. Forest and woodlands are mostly distributed in higher elevations and, with a few exceptions, occur in the eastern portion of San Diego County, including the desert

subregion. These exceptions include oak woodlands, Torrey pine forest and coastal closed-cone coniferous forest, all of which are considered sensitive. Oak woodlands are regulated at the State level (Senate Bill 1334) and also considered sensitive by the County of San Diego (Tier I sensitivity level) and the MSCP and MHCP. Oak woodlands are composed of a variety of oak-dominated vegetation communities that span from the coast to the mountains in the eastern part of the County. Engelmann oak (*Quercus engelmannii*) is considered sensitive in San Diego County.

Most forest and woodland communities are not considered sensitive except for Torrey pine forest, which is an NCCP-covered vegetation community regulated as a Tier I vegetation community. Likewise regulated under the Tier I classification, southern interior cypress forest contains sensitive tree species that are protected, such as Tecate cypress (*Hesperocyparis forbesii*), which is restricted to three locations in San Diego County, and Cuyamaca cypress (*Hesperocyparis stephensonii*), which only occurs in one location in the United States, on Cuyamaca peak (Sproul et al. 2011). The forest and woodland community in the region is mainly composed of native vegetation communities with the exception of eucalyptus woodland, which is composed of monocultures of eucalyptus (or gum) trees (*Eucalyptus* sp.) that were imported from Australia to provide a source for timber and that thrive in San Diego's Mediterranean climate. Eucalyptus woodlands do not provide habitat for native species, with the exception of raptor nesting. Some undifferentiated woodlands that occur in the coastal region may consist of nonnative acacia species, also imported from Australia as an ornamental plant; like eucalyptus woodland, they do not provide ecological value to native species.

FEDERALLY AND STATE-REGULATED WATERS AND WETLANDS

As detailed in Section 4.4.2, waters and wetlands, including riparian habitat, are regulated by federal and State agencies through a variety of different laws and ordinances. The USACE regulates activities in waters of the U.S., and CDFW, RWQCB, and the CCC have various responsibilities for regulating activities in waters of the state; depending on the regulatory program, wetlands and riparian habitat may also be subject to regulation. The extent of each agency's jurisdiction is defined by its respective regulations, guidance, and/or case law. Waters types (including wetlands and riparian habitat) in the San Diego region that may be considered waters of the U.S. and/or State include the following:

- The Pacific Ocean, bays, lagoons, lakes, and reservoirs.
- Perennial and intermittent (and ephemeral[3]) rivers, streams, and washes.
- Tidal, non-tidal, saline, and freshwater wetlands.
- Wetland and non-wetland riparian habitats.

Data Mapping Sources and Methods

The approximate location of regulated waters (including wetlands, and both non-wetland and wetland riparian habitats) in the San Diego region were mapped using the U.S. Geological Survey's (USGS) National Hydrography Dataset (NHD) (USGS 2021) and the U.S. Fish and Wildlife Service's (USFWS's) National Wetlands Inventory (NWI 2021) dataset. The NHD is the surface-water component of the national map. The NHD is a relatively

[3] The state of California regulates ephemeral waters. However, as of June 22, 2020, the USACE and the U.S. Environmental Protection Agency no longer regulate ephemeral waters; federal waters are now limited to permanent and intermittent waters.

detailed generalized set of digital spatial data that represents the surface waters of the U.S. These data are designed to be used in general mapping and in the analysis of surface water systems. The NWI is a series of topical maps that show wetlands and deepwater habitats. This geospatial information is used by federal, state, and local agencies; academic institutions; and private industry for management, research, policy development, education, and planning activities.

Existing Regulated Waters, Wetlands and Riparian Habitat

Figure 4.4-2 depicts the approximate location of surface waters, wetlands, and riparian habitats in the San Diego region. This figure represents the best currently available information (2021). Although this information provides current information for existing conditions for regulated waters, wetlands, and riparian habitat, the maps and figures provided in the EIR are not intended to be used as the final determination of the type, extent, and jurisdictional status of waters in the San Diego region because the information is not site- or project-specific. Furthermore, since the development of the above-referenced data bases, federal wetlands regulations have changed (June 22, 2020) to exclude waters and wetlands that are considered ephemeral. Because this change is not reflected in the data set presented in this EIR, it is possible that the impacts on federally regulated waters, wetlands, and riparian habitats are overestimated.

SPECIAL-STATUS SPECIES

CEQA Guidelines Section 15380 defines "endangered, rare or threatened species" as "species or subspecies of animal or plant or variety of plant" listed under the Code of Federal Regulations (CFR), Title 50, Part 17.11 or 17.12 or California Code of Regulations (CCR), Title 14, Section 670.2 or 670.5, or a species not included in the above listings but that can be shown to meet the criteria in CEQA Guidelines Section 15380(b). In this circumstance, *endangered* means "when its survival and reproduction in the wild are at risk from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors"; *rare* means that "although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens, or the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the Federal Endangered Species Act." Species that fall under the above criteria are referred to in this EIR as *special-status species*.

State Species of Special Concern and *Fully Protected Species* are animals not necessarily listed under the Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA), but which nonetheless (1) are declining at a rate that could result in listing or (2) have historically occurred in low numbers and known threats to their persistence currently exist. The CNPS Inventory of Rare and Endangered Vascular Plants of California is sanctioned by CDFW, and serves as a Species of Special Concern list for plants. For purposes of analysis in this EIR, special-status species must meet at least one of the following criteria:

- Listed or proposed for listing (including *candidate* species[4]) under the FESA and CESA.

[4] Candidate species are those petitioned species that are actively being considered for listing under FESA, as well as those species for which USFWS has initiated a FESA status review, as announced in the *Federal Register*. Proposed species are those candidate species that were found to warrant listing and have been officially proposed for listing in the *Federal Register*. Under CESA, candidate species are those species currently petitioned for state-listing status.

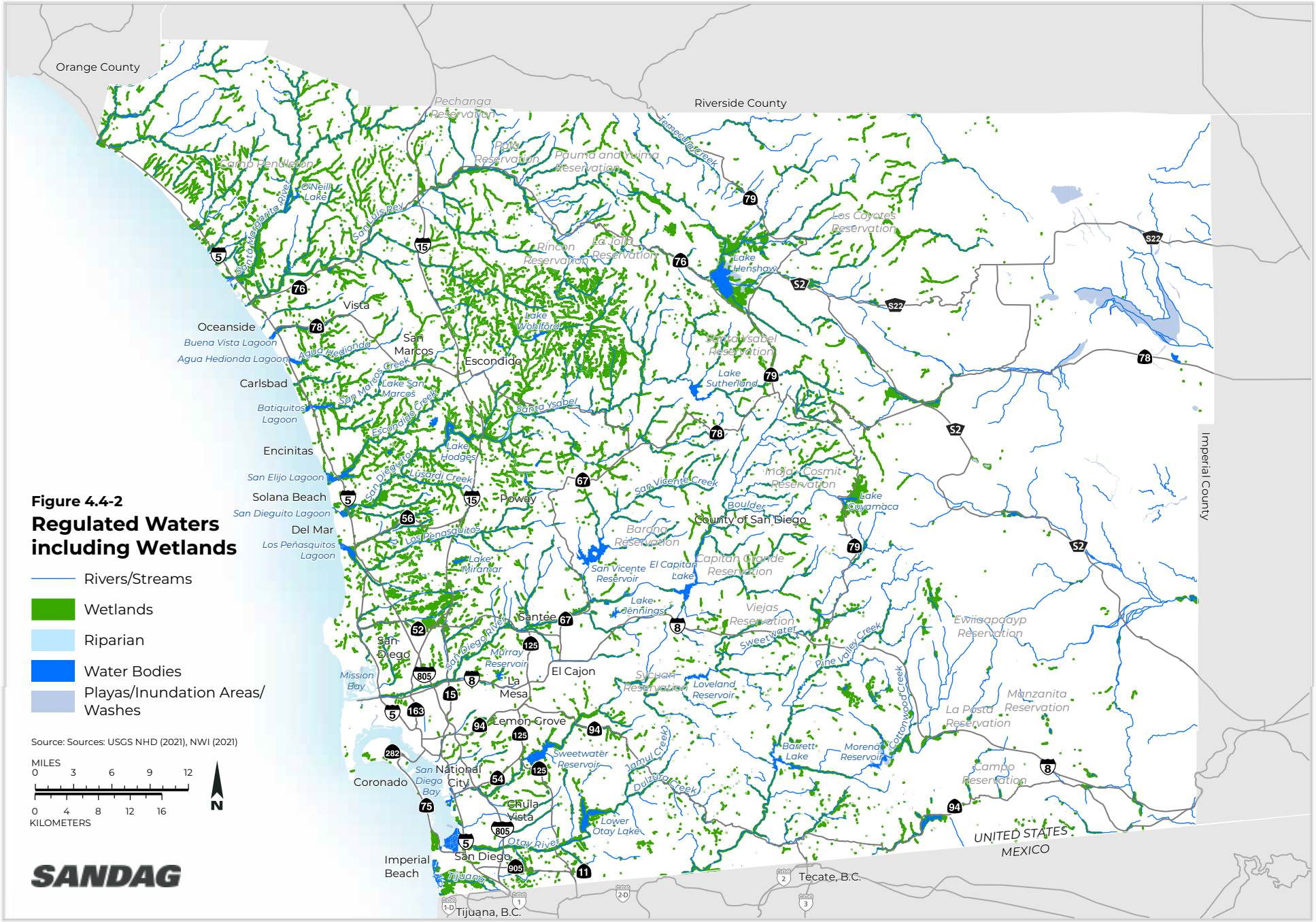
- CDFW Species of Special Concern (CDFW 2021).
- CDFW Fully Protected Species (CDFW 2021).
- CDFW Watch List Species (CDFW 2021).
- California Rare Plant Rank Species (CRPR) are ranked as 1A (presumed extinct in California and rare/extinct elsewhere), 1B (rare, threatened, and endangered in California and elsewhere), 2A (presumed extinct in California, but more common elsewhere), 2B (rare, threatened, or endangered in California, but more common elsewhere), or 3 (plants are those for which more information is needed [a review list]) (CNPS 2018). All plants constituting CRPR 1A, 1B, 2A, 2B, and 3 meet the definitions of Sections 2062 and 2067 (CESA) of the CFGC (CNPS 2018).
- Some, but not all, CRPR 4 plant species meet the definitions of Sections 2062 and 2067 (CESA) of the CFGC (CNPS 2018). CRPR 4 plants are those of limited distribution (watch list) (CNPS 2018).
- Species considered sensitive or narrow endemic by ~~approved~~ adopted NCCPs and Habitat Conservation Plans (HCPs).

Data Sources and Methods

The occurrence and location of special-status species changes based on climate, seasonality, habitat suitability, and other site-specific factors. The special-status species identified in this EIR are those that are contained within the most recent versions of the data sources described above. However, there are areas in the San Diego region for which no data are available because they have not been surveyed and/or recorded. Therefore, site-specific surveys would be required at the project level to determine presence of special-status species.

San Diego is one of the global biodiversity hot spots, and contains a high diversity of species, many of which are considered sensitive. For this programmatic level of analysis, collecting site-specific information is not practicable, because information collected now does not guarantee presence or absence of a species in the future. Therefore, for the purpose of this EIR, widely available databases were used. Suitable species habitat was ascertained from the 2021~~17~~ County of San Diego vegetation layer. Critical Habitat data (USFWS 2021) was used to identify regulated habitat of federally listed species; however, critical habitat does not translate into actual occupancy of the associated listed species. The analysis in this EIR uses GIS data for recent (i.e., within the last 10 years) known locations of listed plant and animal species to determine species potential to occur in a given area. Recorded occurrences of special-status species in the San Diego region were compiled from the CNDDB (CDFW 2021), County of San Diego's SanBios data (~~SanGIS 20~~County of San Diego 2021c~~17~~), and USFWS Occurrence Information (USFWS 2020) as well as species habitat models developed by the County of San Diego LUEG-GIS (accessed in 2021). Occurrence data provide an overview of the historic presence of species; however, it is understood that not all known species are included in these data sets; therefore, project-specific information must be collected at the time of or immediately prior to project construction (during the most opportune season for maximum detection) to verify presence or absence of sensitive species. Suitable habitat or designated critical habitat alone does not guarantee that the species occupies said suitable habitat.

Botanical species nomenclature in this EIR follows Rebman and Simpson's (2014) *Checklist of the Vascular Plants of San Diego County*. Avian species nomenclature follows the American Ornithologists Union (2018). Non-avian species nomenclature follows the CDFW Online Special Animals List (CDFW 2021).


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
Santa Ysabel Reservation
Iipay Nation of Santa Ysabel
Inaja Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
La Posta Reservation
Manzanita Reservation
Campo Reservation
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
San Diego
County of San Diego
Tijuana
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Lake Henshaw
Lake Wohlford
Lake San Marcos
Lake Sutherland
Lake Hodges
Lake Miramar
Lake Jennings
San Vicente Reservoir
El Capitan Lake
Lake Cuyamaca
Boulder Lake
Barrett Lake
Morena Reservoir
Loveland Reservoir
Sweetwater Reservoir
Lower Otay Lake
Murray Reservoir
O'Neill Lake
Buena Vista Lagoon
Agua Hedionda Lagoon
Batiquitos Lagoon
San Elijo Lagoon
San Dieguito Lagoon
Los Peñasquitos Lagoon
Mission Bay
San Diego Bay
San Luis Rey River
Santa Margarita River
San Marcos Creek
Escondido Creek
San Dieguito River
Lusardi Creek
Los Peñasquitos
San Vicente Creek
Sweetwater River
Otay River
Jamul Creek
Dulzura Creek
Pine Valley Creek
Cottonwood Creek
Tenaja Creek
Figure 4.4-2
Regulated Waters including Wetlands
Rivers/Streams
Wetlands
Riparian
Water Bodies
Playas/Inundation Areas/ Washes
Source: Sources: USGS NHD (2021), NWI (2021)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Special-Status Species

Federally and/or State-Listed Plant Species

There are 34 federally or state-listed or candidate plant species with potential to occur in the San Diego region (Table 4.4-2), including 14 that are federally listed as endangered, 6 that are federally listed as threatened, 22 that are State listed as endangered, 2 that are State listed as threatened, and 6 that are State listed as rare (Table 4.4-2). Table 4.4-2 also lists the habitat typically used by each species and any rarity information, if available. Figure 4.4-3 illustrates the results of regional database information for federally and/or state-listed plant species in the San Diego region.

Table 4.4-2
Listed Plant Species Potentially Occurring Within the San Diego Region

Common Name	Scientific Name	Listing Status[1]		Habitat
		Federal	State	
San Diego thorn-mint	*Acanthomintha ilicifolia*	FT	SE	Chaparral, coastal sage scrub, valley and foothill grassland, vernal pools.
San Diego ambrosia	*Ambrosia pumila*	FE		Coastal sage scrub, valley and foothill grassland. Elevation range 20–415 meters. Only 12 populations remain in San Diego County.
Del Mar manzanita	*Arctostaphylos glandulosa* ssp. *crassifolia*	FE		Coastal chaparral, closed-coned coniferous forest. Found on sandy coastal mesas and ocean bluffs; in chaparral or Torrey pine forest. Elevation range 0–365 meters.
Peirson's milk-vetch	*Astragalus magdalenae* var. *peirsonii*	FT	SE	Desert sand dune habitat with loose sand. Several collections from 2005 near Borrego Mountain at 224 meters.
coastal dunes milk-vetch	*Astragalus tener* var. *titi*	FE	SE	Coastal bluff scrub, coastal dunes. Found in moist, sandy depressions of bluffs or dunes along and near the Pacific Ocean; one recorded occurrence on a clay terrace. Elevation range 1–50 meters.
Encinitas baccharis	*Baccharis vanessae*	FT	SE	Chaparral. Found on sandstone soils in steep, open, rocky areas with chaparral associates. Elevation range 60–720 meters.
Nevin's barberry	*Berberis nevinii*	FE	SE	Chaparral, cismontane woodland, coastal scrub, riparian scrub. Found on steep, north- facing slopes or in low grade sandy washes. Elevation range 290–1,575 meters.

Common Name	Scientific Name	Listing Status[1]		Habitat
		Federal	State	
thread-leaved brodiaea	*Brodiaea filifolia*	FT	SE	Cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools. Usually associated with annual grassland and vernal pools; often surrounded by shrubland habitats. Found in clay soils. Elevation range 25–860 meters.
Dunn's mariposa lily	*Calochortus dunnii*		SR	Closed-cone coniferous forest, chaparral. Found in gabbro or metavolcanic soils; also known from sandstone; often associated with chaparral. Elevation range 375–1,830 meters.
salt marsh bird's-beak	*Chloropyron maritimum* ssp. *Maritimum*	FE	SE	Coastal salt marsh, coastal dunes. Limited to the higher zones of the salt marsh habitat. Elevation range 0–30 meters.
Orcutt's spineflower	*Chorizanthe orcuttiana*	FE	SE	Coastal scrub, chaparral, closed-cone coniferous forest. Found from Del Mar to Point Loma, in the San Diego region. Found in sandy sites and openings; sometimes in transition zones. Elevation range 3–125 meters.
Otay tarplant	*Deinandra conjugens*	FT	SE	Coastal scrub, valley and foothill grassland. Found on coastal plains, mesas, and river bottoms; often in open, disturbed areas; clay soils. Elevation range 25–300 meters.
Mojave tarplant	*Deinandra mohavensis*		SE	Riparian scrub, chaparral. Found in low sand bars in river beds; mostly in riparian areas or ephemeral grassy areas. Elevation range 850–1,600 meters.
Cuyamaca larkspur	*Delphinium hesperium* ssp. *Cuyamacae*		SR	Lower montane coniferous forest, meadows. Found on dried edge of grassy meadows and mesic sites. Elevation range 1,210–1,630 meters.
Mount Laguna aster	*Dieteria asteroides* var. *lagunensis*		SR	Cismontane woodland, lower montane coniferous forest. Found in openings in woodland or forest. Elevation range 800–2,400 meters.

Common Name	Scientific Name	Listing Status[1]		Habitat
		Federal	State	
Cuyamaca Lake downingia	*Downingia concolor* var. *brevior*		SE	Meadows (mesic), vernal pools. Found on shores of Cuyamaca Lake in San Diego region. Located in vernal seeps, lakes, and pools, and on mudflats, with *Orthocarpus*, *Limnanthes*, and *Collinsia*. Elevation range 1,400–1,500 meters.
short-leaved dudleya	*Dudleya brevifolia*		SE	Chaparral, coastal scrub. Found on Torrey sandstone soils; in pebbly openings. Elevation range 30–250 meters.
San Diego button-celery	*Eryngium aristulatum* var. *parishii*	FE	SE	Vernal pools, coastal scrub, valley and foothill grassland. Found in San Diego mesa hardpan and claypan vernal pools, and in southern interior basalt flow vernal pools; usually surrounded by scrub. Elevation range 15–620 meters.
Mexican flannelbush	*Fremontodendron mexicanum*	FE	SR	Closed-cone coniferous forest, chaparral, cismontane woodland. Usually scattered along the borders of creeks or in dry canyons; sometimes on gabbro soils. Elevation range 10–490 meters.
Borrego bedstraw	*Galium angustifolium* ssp. *borregoense*		SR	Sonoran desert scrub. Found on steep walls and (usually north-facing) slopes in rocky watersheds or canyons. Elevation range 350–1,100 meters.
Orcutt's hazardia	*Hazardia orcuttii*		ST	Chaparral, coastal scrub, often on clay; in grassy edges of chaparral and coastal scrub. Elevation range 0–85 meters. Only one population remains in San Diego County.
Algodones Dunes sunflower	*Helianthus niveus* ssp. *tephrodes*		SE	Desert dunes. Elevation range 50–100 meters.
Parish's meadowfoam	*Limnanthes alba* ssp. *parishii*		SE	Meadows and seeps, vernal pools. Vernally moist areas and temporary seeps of highland meadows and plateaus; often bordering lakes and streams. Elevation range 600–1,760 meters.
willowy monardella	*Monardella viminea*	FE	SE	Coastal scrub/alluvial ephemeral washes with adjacent coastal scrub, chaparral, or sycamore woodland. In canyons, in rocky and sandy places, sometimes in washes or floodplains. Elevation range 50–225 meters.

Common Name	Scientific Name	Listing Status[1]		Habitat
		Federal	State	
Gambel's water cress	*Nasturtium gambelii*	FE	ST	Marshes and swamps. Freshwater and brackish marshes at the margins of lakes and along streams, in or just above the water level. Elevation range 5–1,305 meters.
spreading navarretia	*Navarretia fossalis*	FT		Vernal pools, chenopod scrub, marshes and swamps, and playas. San Diego hardpan and San Diego claypan vernal pools; in swales and vernal pools, often surrounded by other habitat types. Elevation range 30–1,300 meters.
Dehesa nolina	*Nolina interrata*		SE	Chaparral. Typically on rocky hillsides or ravines on ultramafic soils (gabbro or metavolcanic). Elevation range 180–855 meters.
California orcutt grass	*Orcuttia californica*	FE	SE	Vernal pools. Elevation range 15–660 meters.
Baja California birdbush	*Ornithostaphylos oppositifolia*		SE	Chaparral. Associated with Ceanothus verrucosus and Salvia mellifera in California. Elevation range 55–800 meters.
Gander's ragwort	*Packera ganderi*		SR	Recently burned sites and gabbro outcrops. Elevation range 400–1,200 meters.
San Bernardino blue grass	*Poa atropurpurea*	FE		Meadows and seeps. Mesic meadows of open pine forests and grassy slopes, loamy alluvial to sandy loam soil. Elevation range 1,350– 2,455 meters.
San Diego mesa mint	*Pogogyne abramsii*	FE	SE	Vernal pools. Vernal pools within grasslands, chamise chaparral or coastal sage scrub communities; with other rare plants. Elevation range 90–200 meters.
Otay Mesa mint	*Pogogyne nudiuscula*	FE	SE	Vernal pools. Dry beds of vernal pools and moist swales with Eryngium aristulatum var. parishii and Orcuttia californica. Elevation range 85–250 meters.
small-leaved rose	*Rosa minutifolia*		SE	Coastal scrub, chaparral. In California on cobbly soil at the head of a small, dry canyon on Otay Mesa. Elevation range 150–160 meters.

Sources: USFWS 2021, CDFW 2021, Baldwin et al. 2012, Jepson 2018, Rebman and Simpson 2014.
FE = Federally Endangered, FT = Federally Threatened, SE = State Endangered, ST = State Threatened, SR = State Rare.

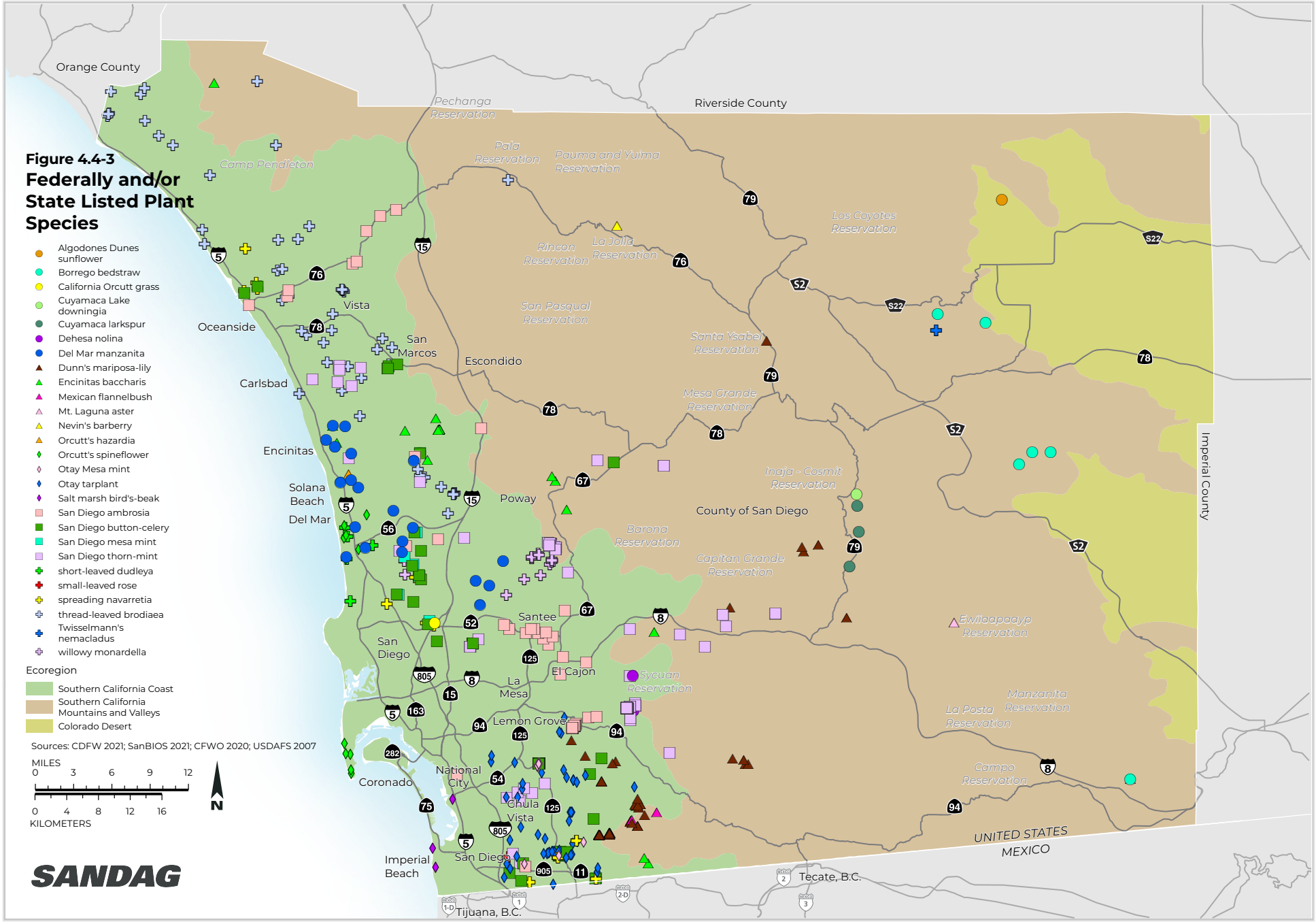


Figure 4.4-3
Federally and/or State Listed Plant Species
Algodones Dunes sunflower
Borrego bedstraw
California Orcutt grass
Cuyamaca Lake downingia
Cuyamaca larkspur
Dehesa nolina
Del Mar manzanita
Dunn's mariposa-lily
Encinitas baccharis
Mexican flannelbush
Mt. Laguna aster
Nevin's barberry
Orcutt's hazardia
Orcutt's spineflower
Otay Mesa mint
Otay tarplant
Salt marsh bird's-beak
San Diego ambrosia
San Diego button-celery
San Diego mesa mint
San Diego thorn-mint
short-leaved dudleya
small-leaved rose
spreading navarretia
thread-leaved brodiaea
Twisselmann's nemacladus
willowy monardella
Ecoregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Sources: CDFW 2021; SanBIOS 2021; CFWO 2020; USDAFS 2007
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Los Coyotes Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Barona Reservation
Capitan Grande Reservation
Inaja - Cosmit Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
La Posta Reservation
Manzanita Reservation
Campo Reservation
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.

Non-Federally and/or Non-State-Listed Special-Status Plant Species

In addition to federally and/or state-listed plants, approximately 244 additional special-status plant species have known distributions within the San Diego region. These species include CRPR species, non-listed NCCP-covered species (e.g., narrow, endemic species), or species that otherwise meet the special-status species criteria, as discussed above. These non-listed special-status plant species have the potential to occur throughout the San Diego region in their respective riparian, wetland, and upland habitats. A list of these additional special-status plant species and their general habitat affinities is presented in Appendix E-2.

Federally and/or State-Listed Animal Species

There are 29 federally and/or state-listed or candidate animal species that have potential to be found within the San Diego region, as year-round residents or as migrants that reoccur seasonally to breed (Table 4.4-3). These 29 species include 5 invertebrate, 4 fish, 4 reptile and amphibian, 13 bird, and 3 mammal species. Of these, 4 are considered extirpated from the San Diego region: California red-legged frog (*Rana draytonii*), southern mountain yellow-legged frog (*Rana muscosa*), California black rail (*Laterallus jamaicensis coturiculus*), and the bank swallow (*Riparia riparia*), which is known to occur in the San Diego region as a rare migrant, but for which the last breeding colony in the San Diego region has been extirpated. Figures 4.4-4 through 4.4-8 illustrate the results of regional database information for federally and/or state-listed wildlife species in the San Diego region.

Non-Federally and/or Non-State-Listed Special-Status Wildlife Species

In addition to federally and/or state-listed wildlife, approximately 138 additional special-status wildlife species have known distributions within the San Diego region. These species include those considered special status by CDFW or species classified by the MSCP/MHCP as covered species, or otherwise meet the criteria discussed above. This list includes an additional 18 invertebrate, 1 fish, 3 amphibian, 18 reptile, 68 bird, and 47 mammal species. These non-listed special-status wildlife species have the potential to occur throughout the San Diego region in each of their respective riparian, wetland, and upland habitats. A list of these additional special-status wildlife species and their general habitat affinities is presented in Appendix E-3.

Table 4.4-3
Listed Wildlife Species Potentially Occurring Within the San Diego Region

Common Name	Scientific Name	Listing Status[1]		Habitat
		Federal	State	
Invertebrates				
San Diego fairy shrimp	*Branchinecta sandiegonensis*	FE		Restricted to vernal pools, hardpan and claypan pools. Orange and San Diego counties, Baja California.
Riverside fairy shrimp	*Streptocephalus woottonii*	FE		Restricted to deep, large vernal pools with long periods of inundation. San Diego (within 15 kilometers of the ocean) and Riverside counties.

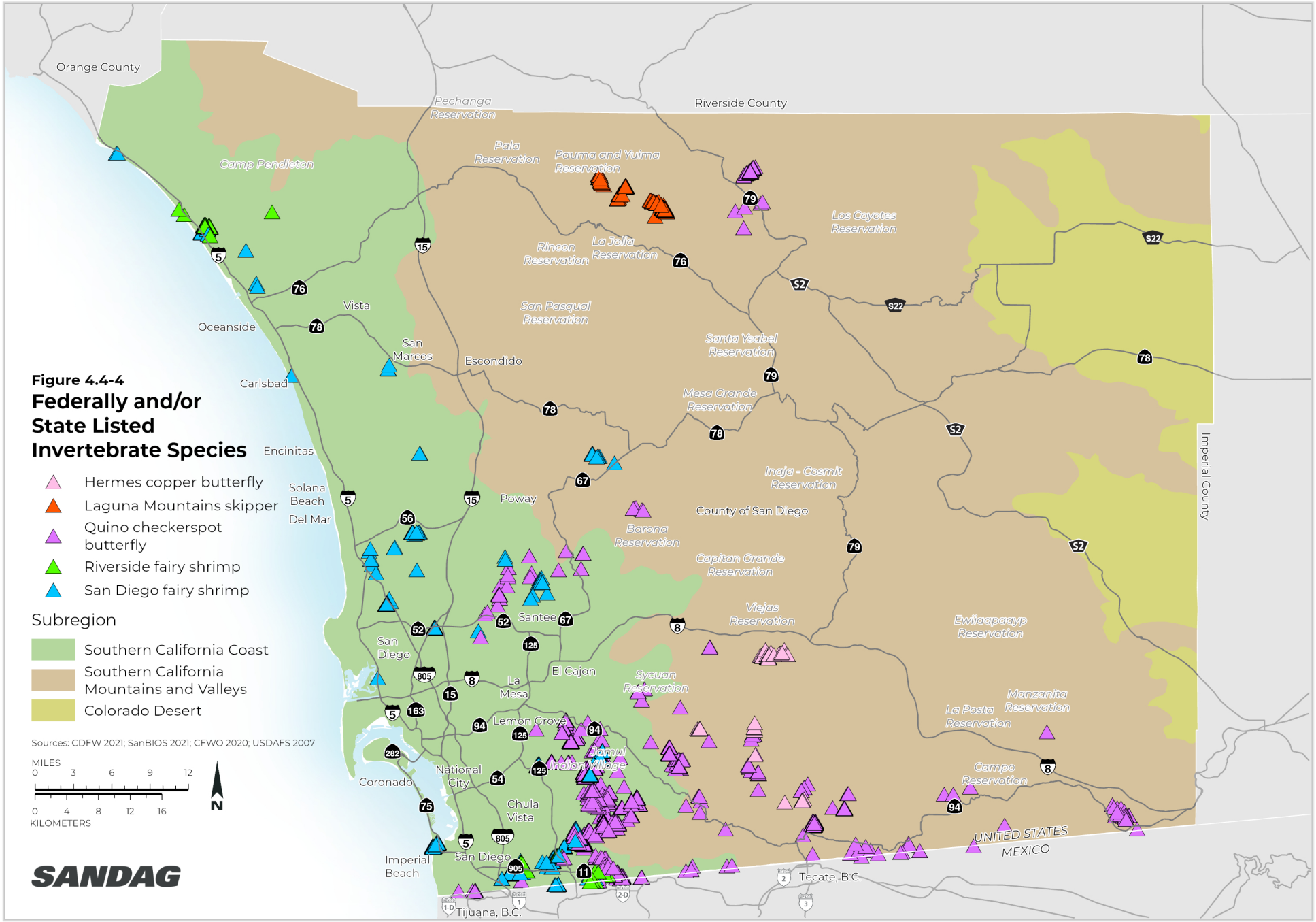
Common Name	Scientific Name	Listing Status[1]		Habitat
		Federal	State	
Laguna Mountains skipper	*Pyrgus ruralis lagunae*	FE		Only in a few open meadows in yellow pine forest between an elevation of 1,524 and 1,828 meters in the vicinity of Mt Laguna and Palomar mountains. Host plant is *Horkelia bolanderi clevelandi.*
Quino checkerspot butterfly	*Euphydryas editha quino*	FE		Native and nonnative grasslands, coastal sage scrub, open chaparral, and other open vegetation community types.
Hermes copper butterfly	*Lycaena hermes*	Candidate		Southern mixed chaparral and coastal sage scrub at the western edge of Laguna Mountains. Host plant is *Rhamnus crocea*.
Fish				
desert pupfish	*Cyprinodon macularius*	FE	SE	Desert ponds, springs, marshes, and streams in Southern California.
tidewater goby	*Eucyclogobius newberryi*	FE		Brackish shallow lagoons and lower stream reaches with still water.
unarmored threespine stickleback	*Gasterosteus aculeatus williamsoni*	FE	SE	Found in weedy pools, backwaters, and among emergent vegetation at the stream edge in small streams.
southern steelhead	*Oncorhynchus mykiss irideus*	FE		Coastal rivers. Federal listing refers to populations from Santa Maria River south to southern extent of range (San Mateo Creek in San Diego region though species was detected in San Luis Rey in 2005 and 2007; previously occurred in Santa Margarita, San Dieguito, San Diego, Sweetwater and Otay rivers, where apparently extirpated; recently observed by USGS in Sandia Creek).
Amphibians				
arroyo toad	*Anaxyrus californicus*	FE		Gravelly or sandy washes, stream and river banks. Upland habitat near washes and streams such as sage scrub and mixed chaparral habitats.
California red-legged frog	*Rana draytonii*	FT		Slow parts of streams, lakes, reservoirs, ponds, and other usually permanent water sources; primarily in wooded areas in lowlands and foothills, but also can be found in grassland. Typical habitat consists of deep-water pools ringed by thick vegetation (especially arroyo willow or native cattails). Extirpated in San Diego region.

Common Name	Scientific Name	Listing Status[1]		Habitat
		Federal	State	
southern mountain yellow-legged frog	*Rana muscosa*	FT	SE	Always encountered within a few feet of water. Federal listing includes populations in the San Gabriel, San Jacinto, and San Bernardino mountains. Population formerly on Palomar Mountain considered extirpated.
Reptiles				
barefoot gecko	*Coleonyx switaki*		ST	Found in arid rocky areas on flatlands, canyons, and thornscrub, especially where there are large boulders and rock outcrops, and where vegetation is sparse.
Birds				
golden eagle	*Aquila chrysaetos*	BGEPA	FP	Occurs over large expanses of landscape and forages in diverse habitat types. Nests on cliffs and in large trees.
bald eagle	*Haliaeetus leucocephalus*	FDR, BGEPA	SE	Occurs primarily near large lakes with open water. Also known to nest in grasslands near small ponds.
California black rail	*Laterallus jamaicensis coturiculus*		ST	Inhabits freshwater marshes, wet meadows, and shallow margins of saltwater marshes bordering larger bays. Extirpated in San Diego region.
light-footed Ridgway's rail	*Rallus obsoletus levipes*	FE	SE	Found in Southern California in coastal salt marshes, especially those dominated by cordgrass.
western snowy plover	*Charadrius nivosus*	FT		Nests on beaches, dunes, and salt flats in San Diego region, with the highest concentrations in two areas: Marine Corps Base (MCB) Camp Pendleton and the Silver Strand.
California least tern	*Sternula antillarum browni*	FE	SE	A ground nesting bird that requires undisturbed stretches of beach and coastline.
western yellow-billed cuckoo (western distinct population segment)	*Coccyznus americanus*	FT	SE	Broadleaf riparian forests.
southwestern willow flycatcher	*Empidonax trailli extimus*	FE	SE	Restricted to a few colonies in riparian woodlands scattered throughout Southern California. Riparian forests are integral to this species' persistence.

Common Name	Scientific Name	Listing Status[1]		Habitat
		Federal	State	
tricolored blackbird	*Agelaius tricolor*		ST	Freshwater marshes with cattails and other emergent vegetation.
least Bell's vireo	*Vireo belli pusillus*	FE	SE	Riparian woodland with understory of dense young willows or mulefat and willow canopy.
bank swallow	*Riparia*		ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, or ocean to dig nesting hole. Only known colony extirpated from San Diego region.
coastal California gnatcatcher	*Polioptila californica californica*	FT		Diegan coastal sage scrub dominated by California sagebrush and flat-topped buckwheat below 762 meters elevation in Riverside County and below 305 meters elevation along the coastal slope.
Belding's savannah sparrow	*Passerculus sandwichensis beldingi*		SE	Occurs primarily in grassland, saline emergent wetland, and wet meadow habitats.
Mammals				
Stephens' kangaroo rat	*Dipodomys stephensi*	FE	ST	Open grassy and weedy areas adjacent to sage scrub.
Pacific pocket mouse	*Perognathus longimembris pacificus*	FE		Coastal sage scrub, coastal strand, and river alluvium on MCB Camp Pendleton.
peninsular bighorn sheep (distinct population segment - population 2)	*Ovis canadensis nelsoni* (distinct population segment - population 2)	FE	ST	Optimal habitat includes steep-walled canyons and ridges bisected by rocky or sandy washes, with available water.

Sources: USFWS 2021, CDFW 2021.

[1] BGEPA = Bald and Gold Eagle Act, FDR=Federally delisted, recovered, FP=State fully protected, FE = Federally Endangered, FT= Federally Threatened, SE = State Endangered, ST = State Threatened.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Campo Reservation
Jamul Indian Village
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El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.4-4
Federally and/or State Listed Invertebrate Species
Hermes copper butterfly
Laguna Mountains skipper
Quino checkerspot butterfly
Riverside fairy shrimp
San Diego fairy shrimp
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Sources: CDFW 2021; SanBIOS 2021; CFWO 2020; USDAFS 2007
MILES
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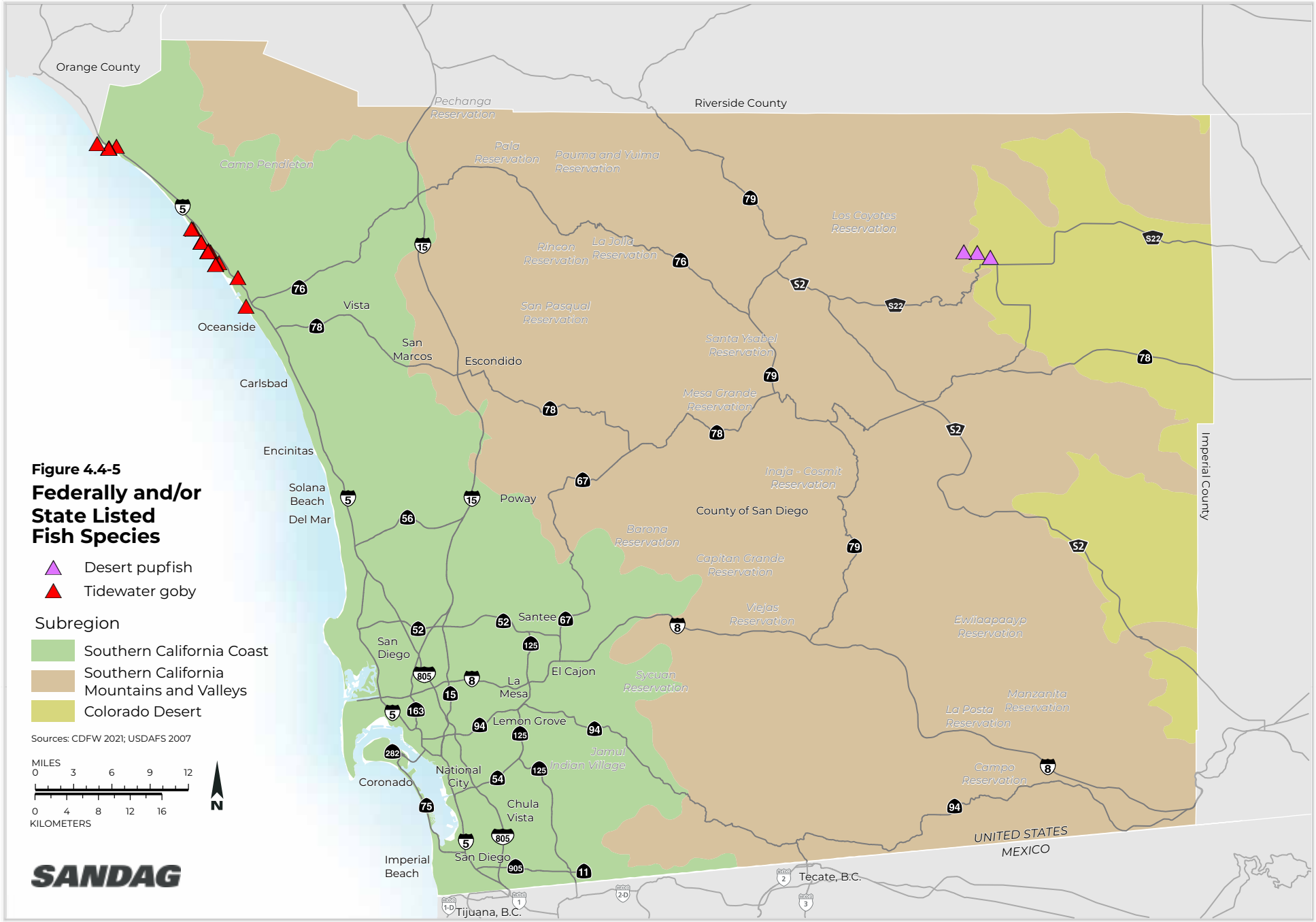
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Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.4-5
Federally and/or State Listed Fish Species
Desert pupfish
Tidewater goby
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Sources: CDFW 2021; USDAFS 2007
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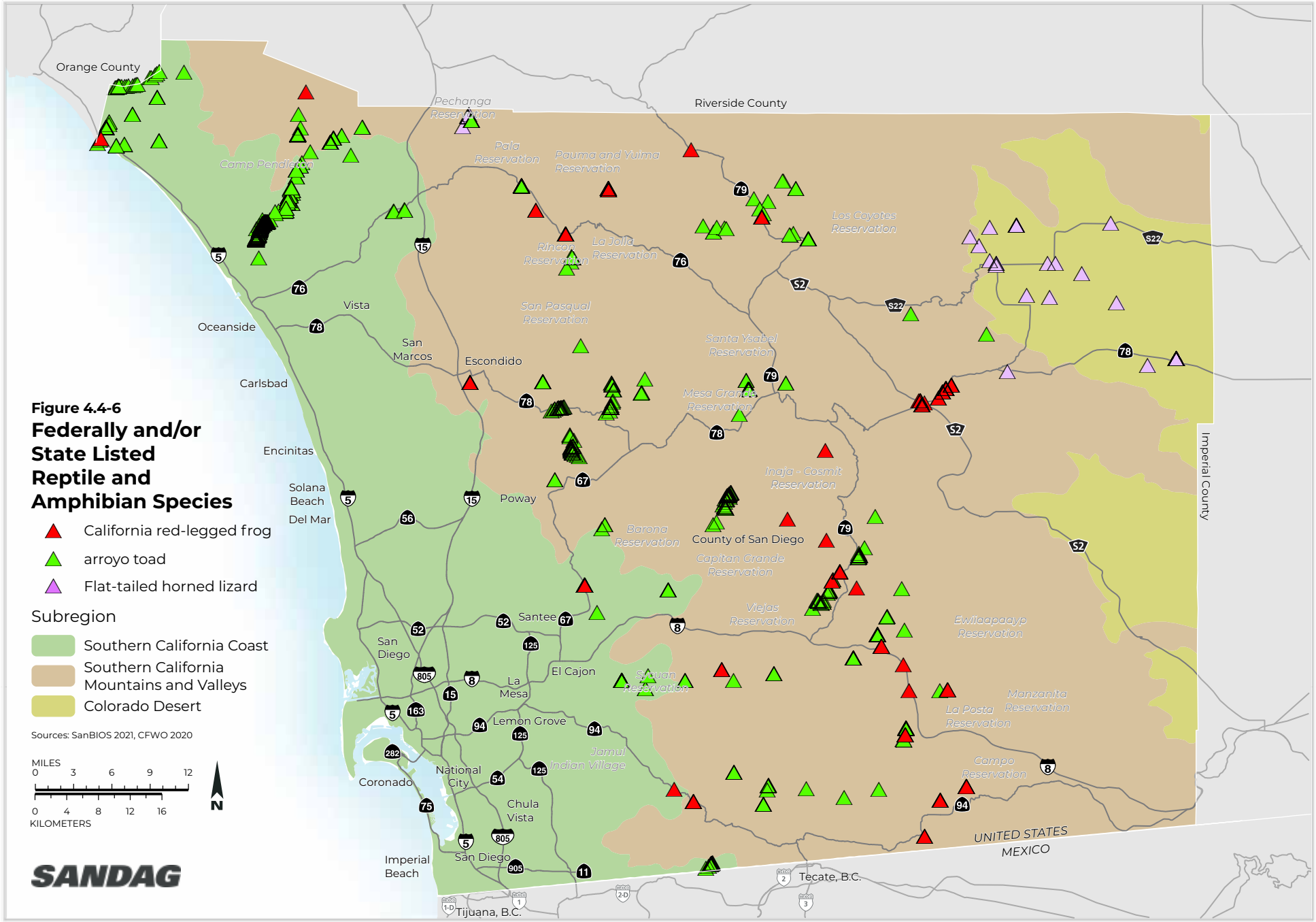
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El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.
Figure 4.4-6
Federally and/or State Listed Reptile and Amphibian Species
California red-legged frog
arroyo toad
Flat-tailed horned lizard
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Sources: SanBIOS 2021, CFWO 2020
MILES
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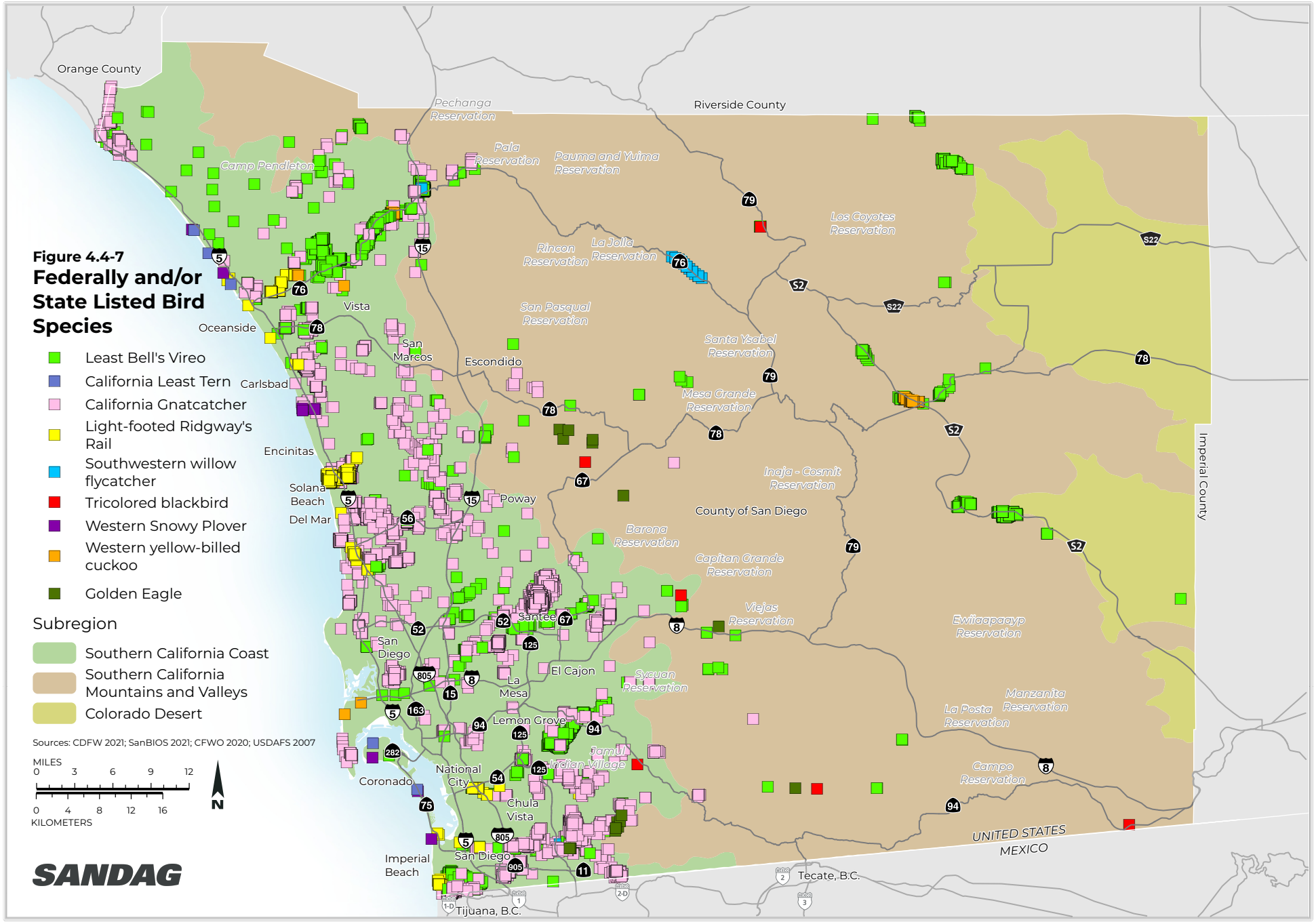
Figure 4.4-7
Federally and/or State Listed Bird Species
Least Bell's Vireo
California Least Tern
California Gnatcatcher
Light-footed Ridgway's Rail
Southwestern willow flycatcher
Tricolored blackbird
Western Snowy Plover
Western yellow-billed cuckoo
Golden Eagle
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Sources: CDFW 2021; SanBIOS 2021; CFWO 2020; USDAFS 2007
MILES
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KILOMETERS
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Riverside County
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Camp Pendleton
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San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
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San Pasqual Reservation
Los Coyotes Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
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Ewiiaapaayp Reservation
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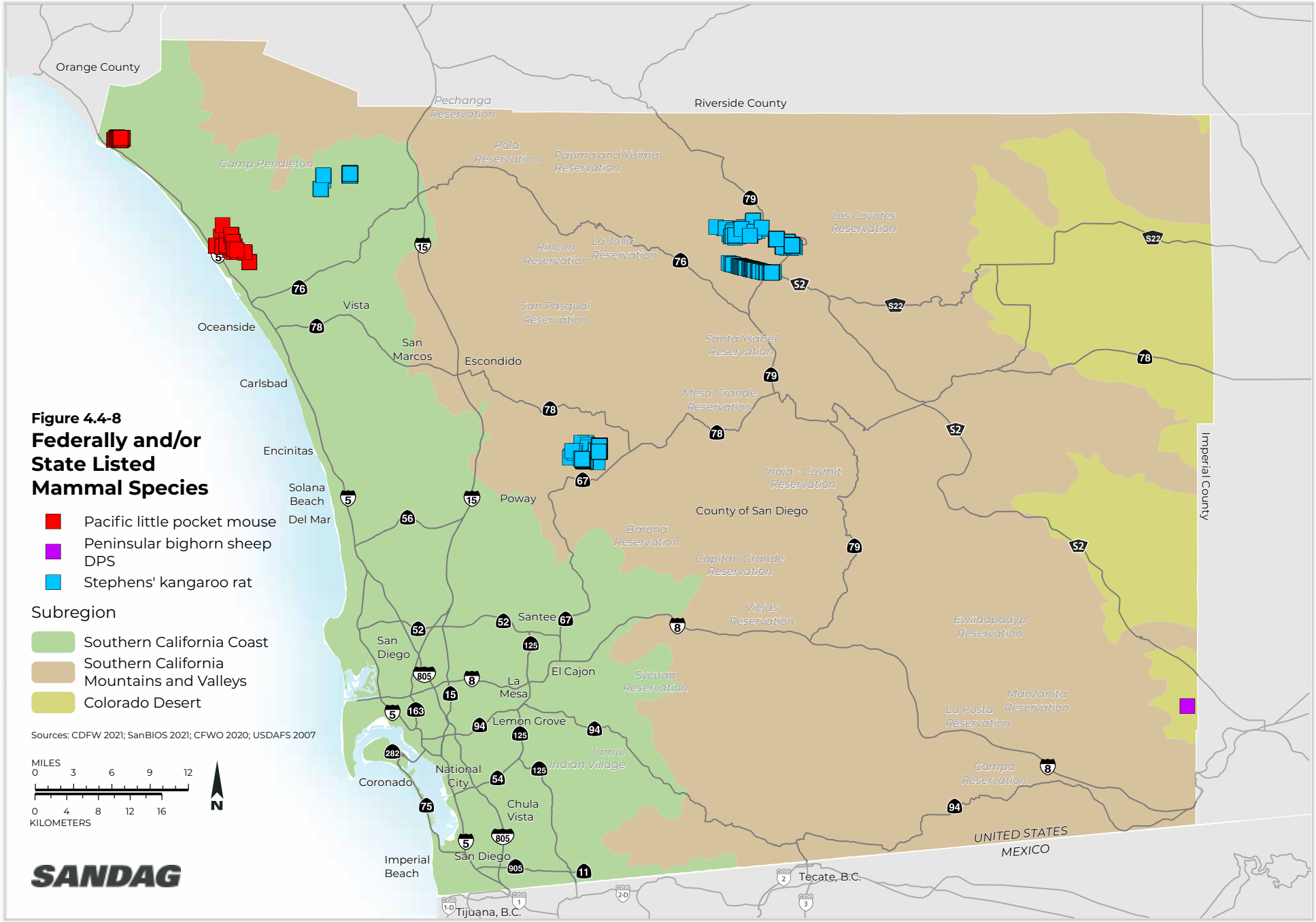
La Posta Reservation
Manzanita Reservation
Campo Reservation
Jamul Indian Village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La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.4-8
Federally and/or State Listed Mammal Species
Pacific little pocket mouse
Peninsular bighorn sheep DPS
Stephens' kangaroo rat
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Sources: CDFW 2021; SanBIOS 2021; CFWO 2020; USDAFS 2007
MILES
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KILOMETERS
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Critical Habitat

USFWS-designated critical habitat for endangered and threatened species is defined as the geographic areas that contain the physical or biological features that are essential to the conservation of federally-listed endangered and threatened species and that may need special management or protection (16 U.S. Code (USC) 1532(5)(A)). The San Diego region (with the exception of military bases) includes species-specific USFWS-designated critical habitat for 20 species (Table 4.4-4). Plant, invertebrate, fish, reptile and amphibian, bird, and mammal species final critical habitat in the San Diego region is displayed on Figures 4.4-9 through 4.4-14.

Table 4.4-4
Critical Habitat[1] Within the San Diego Region

Common Name	Scientific Name	Total Acres[2]	General Location
Plants			
San Diego thorn-mint	*Acanthomintha ilicifolia*	1,749	North of Willows Road near Viejas Indian Reservation
San Diego ambrosia	*Ambrosia pumila*	806	Largest areas south of Rancho San Diego along State Route (SR) 94 and Sweetwater River and southwest of Lake Hodges along Del Dios Highway
thread-leaved brodiaea	*Brodiaea filifolia*	985	Small patches of vernal pool habitat along the northern coastal area of San Diego region
Otay tarplant	*Deinandra conjugens*	6,333	Coastal scrub and grassland habitat in southwest San Diego region
Mexican flannelbush	*Fremontodendron mexicanum*	228	Cedar and Little Cedar canyons just west of Dulzura
willowy monardella	*Monardella viminea*	122	Sycamore and Clark Canyon northeast of Santee Lakes
spreading navarretia	*Navarretia fossalis*	1,068	Small patches of vernal pool habitat along the coastal area of San Diego region
San Bernardino blue grass	*Poa atropurpurea*	1,115	Laguna meadow west of Mount Laguna and Mendenhall Valley northeast of Palomar Mountain
Invertebrates			
San Diego fairy shrimp	*Branchinecta sandiegonensis*	2,918	Vernal pools and basins located on mesa tops or in grasslands in the San Diego region
Hermes copper butterfly	*Lycaena hermes*	35,236	South from State Route 56 in three distinct units: Lopez Canyon, between Miramar and Santee, and in Southeast San Diego south of Interstate 8, east of State Route 125.
Riverside fairy shrimp	*Streptocephalus woottoni*	807	Vernal pools and basins in the southern coastal area of San Diego region
Quino checkerspot butterfly	*Euphydryas editha quino*	40,136	U.S.–Mexican border, including the San Ysidro Mountain region; along SR 94 near the Campo and La Posta Indian Reservations, and northwest of Jacumba
Laguna Mountains skipper	*Pyrgus ruralis lagunae*	6,259	West of Mount Laguna in the Laguna Mountains and north of Palomar Mountain

Common Name	Scientific Name	Total Acres[2]	General Location
Fish			
tidewater goby	Eucyclogobius newberryi	55	Mouth of the San Luis Rey River
Reptiles and Amphibians			
arroyo toad	*Anaxyrus californicus*	60,798	San Juan Creek; San Mateo Creek; Lower and Upper Santa Margarita River; Lower, Middle, and Upper San Luis Rey River; Santa Ysabel Creek; San Diego River; San Vicente Creek; Sweetwater River; and Cottonwood Creek
Birds			
least Bell's vireo	*Vireo belli pusillus*	13,416	San Luis Rey River, Santa Margarita River, San Diego River, Sweetwater River, Tijuana River, Coyote Creek, and Jamul-Dulzura creeks
southwestern willow flycatcher	*Empidonax trailli extimus*	5,373	Santa Margarita River, DeLuz Creek, San Luis Rey River, Pilgrim Creek, Agua Hedionda Creek, Santa Ysabel Creek, Temescal Creek, Temecula Creek, Sweetwater River, and San Diego River.
western snowy plover	*Charadrius nivosus*	406	San Dieguito Lagoon, San Elijo Lagoon Coronado Beach, Silver Strand State Beach, San Diego National Wildlife Refuge, and Tijuana Estuary and Border Field State Park
coastal California gnatcatcher	*Polioptila californica*	76,423	Largest contiguous areas of critical habitat for coastal California gnatcatcher include the San Diego National Wildlife Refuge and surrounding area; the upper San Diego River drainage area as well as areas surrounding the El Capitan Reservoir; open space north of the City of Santee; open space northwest of the City of Ramona; habitat within the MHCP planning area in the northwest San Diego region; and habitat along the Interstate 15 corridor from Escondido to Riverside County
Mammals			
peninsular bighorn sheep (distinct population segment - population 2)	*Ovis canadensis nelson* (distinct population segment - population 2)	261,133	Santa Rosa Mountains, Coyote Canyon, San Ysidro Mountains, Pinyon Mountains, Vallecito Mountains, Carrizo Canyon, In-Ko-Pah Mountains, Jacumba Mountains, Coyote Mountains, and Tierra Blanca Mountains

Source: USFWS 2021.

[1] Critical habitat in this table includes final designated critical habitat and proposed designated critical habitat as of July 2021.

[2] Acres are rounded up or down to the next acre.

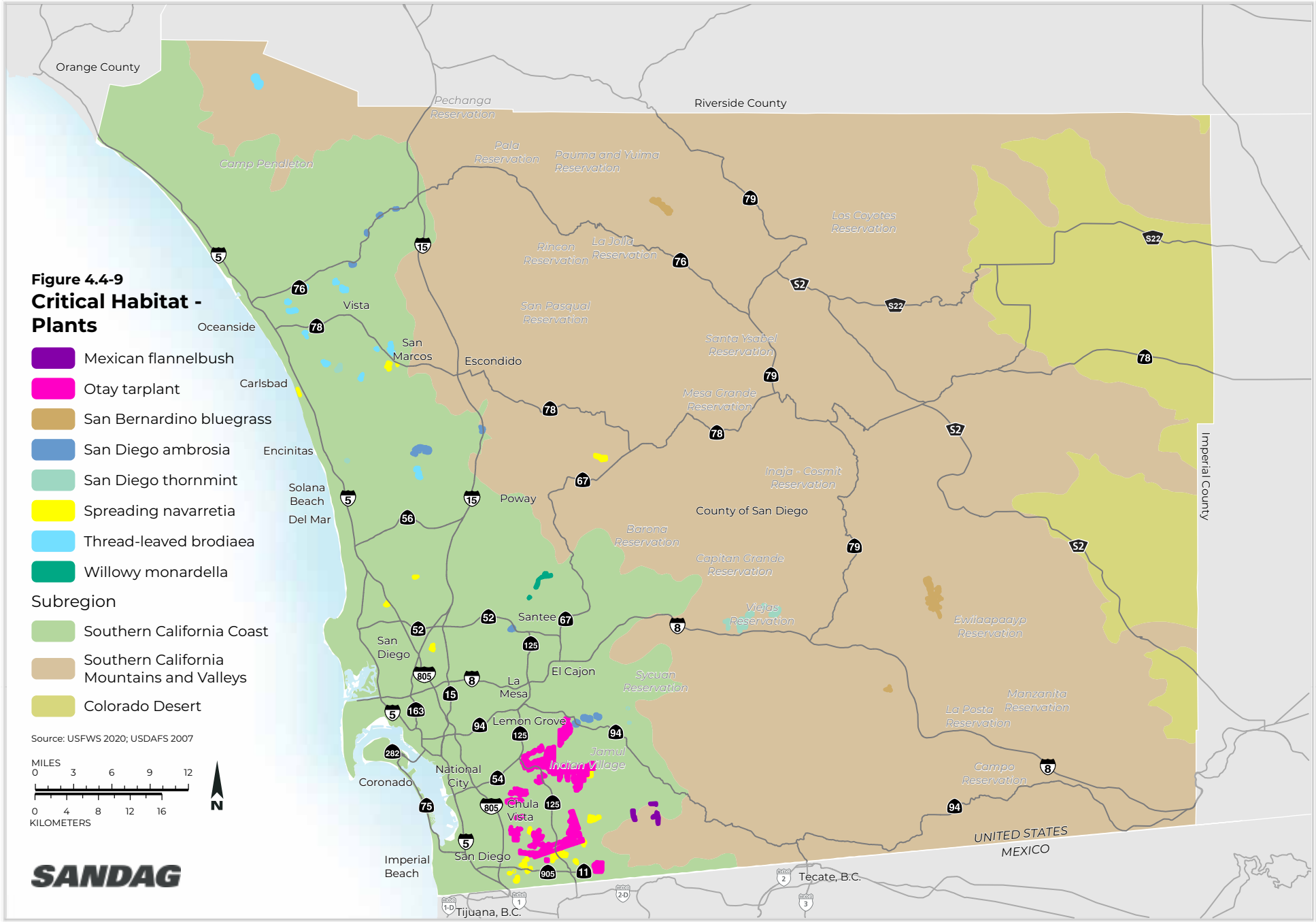
Figure 4.4-9
Critical Habitat - Plants
Mexican flannelbush
Otay tarplant
San Bernardino bluegrass
San Diego ambrosia
San Diego thornmint
Spreading navarretia
Thread-leaved brodiaea
Willowy monardella
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Source: USFWS 2020; USDAFS 2007
MILES
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KILOMETERS
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Riverside County
Imperial County
Camp Pendleton
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Manzanita Reservation
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County of San Diego
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UNITED STATES
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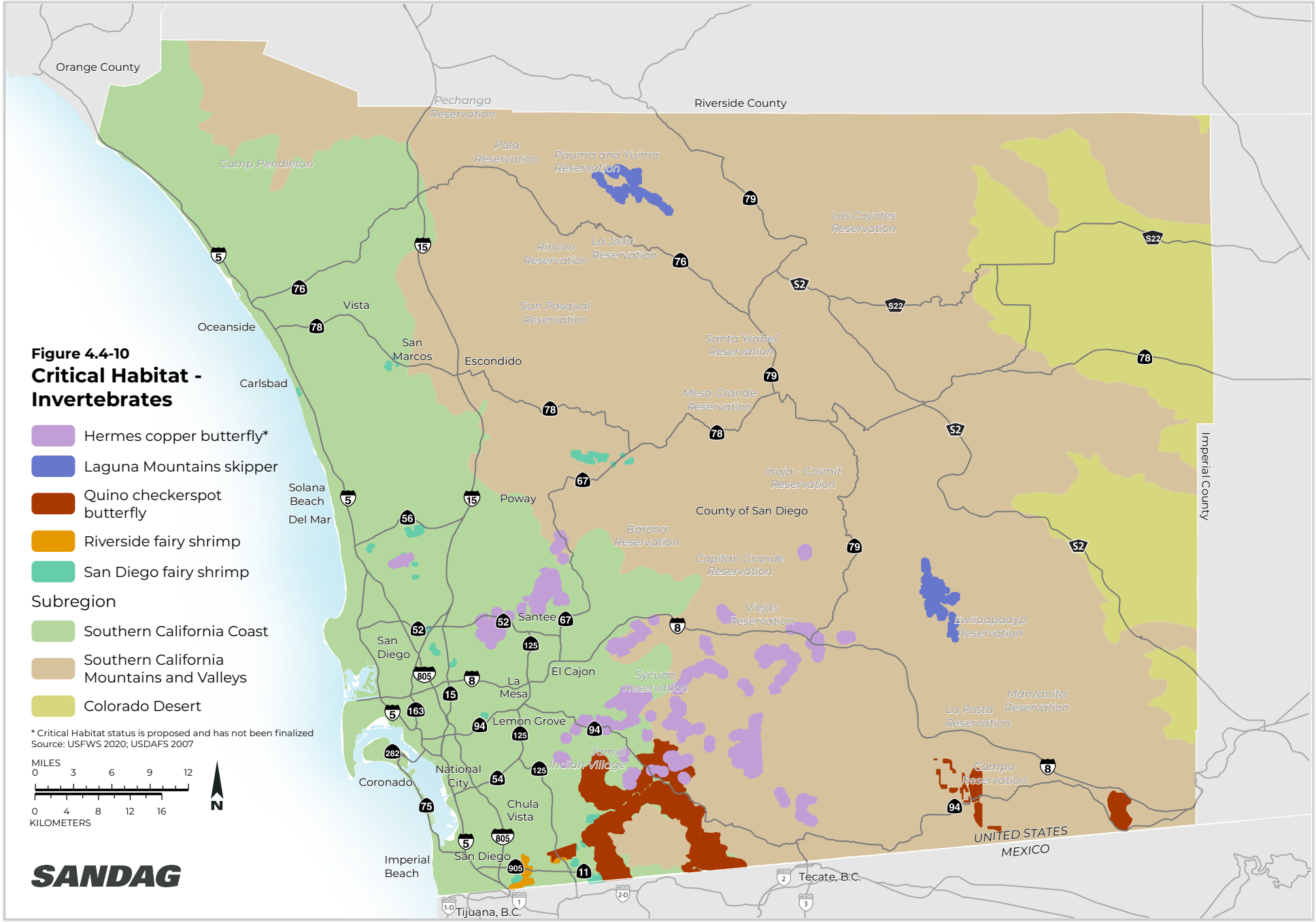
Tijuana, B.C.
Tecate, B.C.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Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
UNITED STATES
MEXICO
Tecate, B.C.
Tijuana, B.C.
Figure 4.4-10
Critical Habitat - Invertebrates
Hermes copper butterfly*
Laguna Mountains skipper
Quino checkerspot butterfly
Riverside fairy shrimp
San Diego fairy shrimp
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
* Critical Habitat status is proposed and has not been finalized
Source: USFWS 2020; USDAFS 2007
MILES
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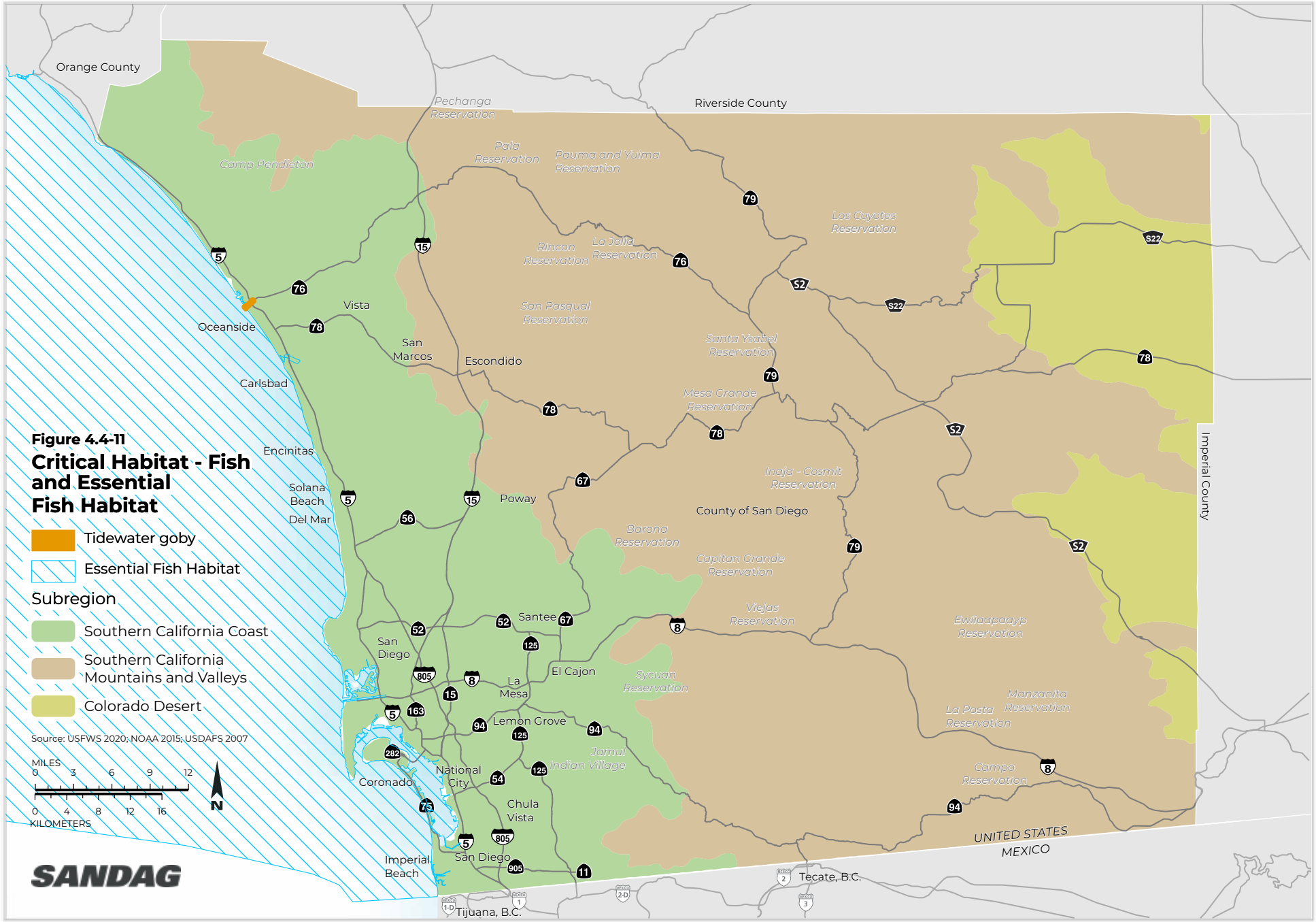
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Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.
Figure 4.4-11
Critical Habitat - Fish and Essential Fish Habitat
Tidewater goby
Essential Fish Habitat
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Source: USFWS 2020; NOAA 2015; USDAFS 2007
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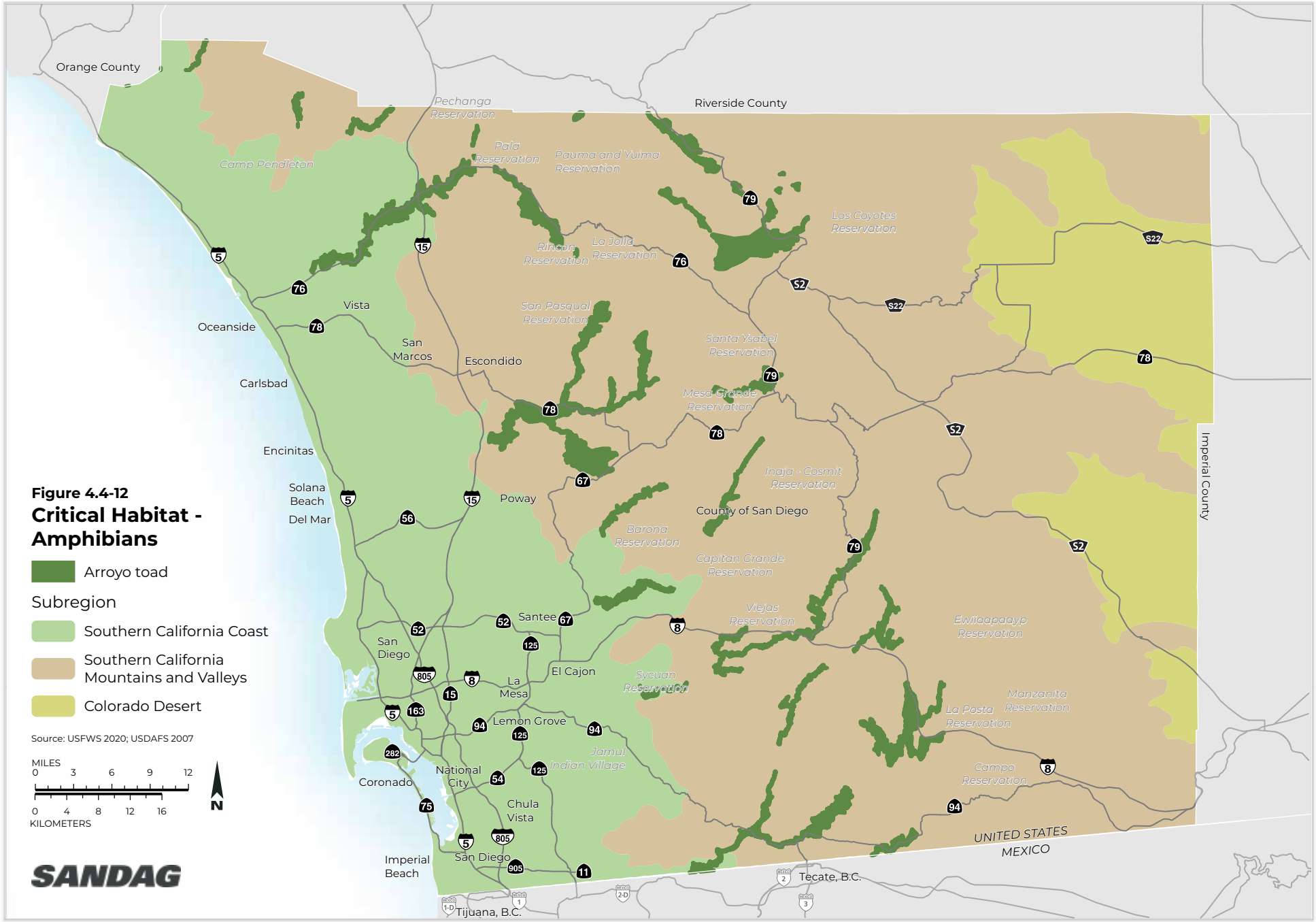
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UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.
Figure 4.4-12
Critical Habitat - Amphibians
Arroyo toad
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Source: USFWS 2020; USDAFS 2007
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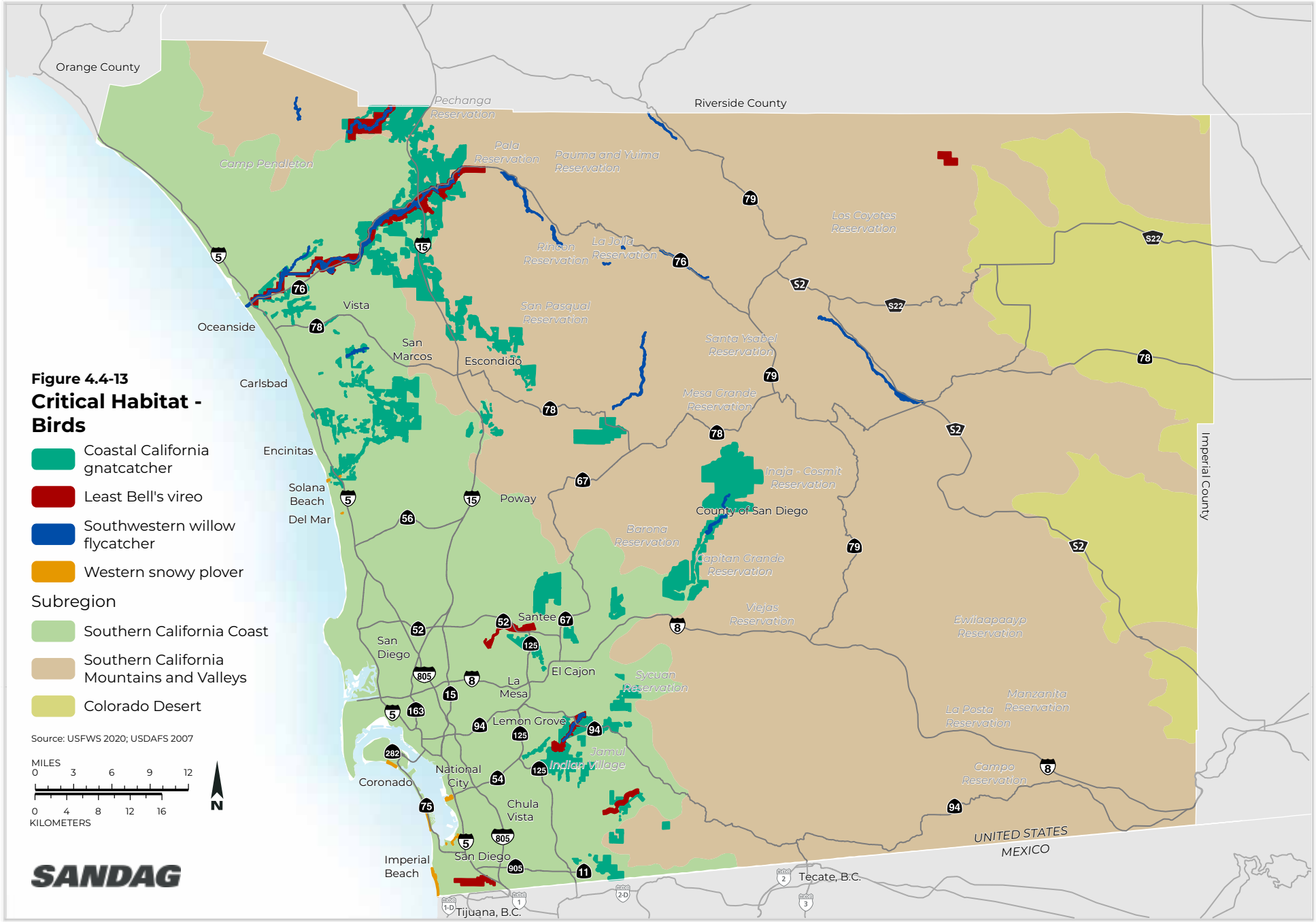
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National City
Chula Vista
Coronado
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.4-13
Critical Habitat - Birds
Coastal California gnatcatcher
Least Bell's vireo
Southwestern willow flycatcher
Western snowy plover
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Source: USFWS 2020; USDAFS 2007
MILES
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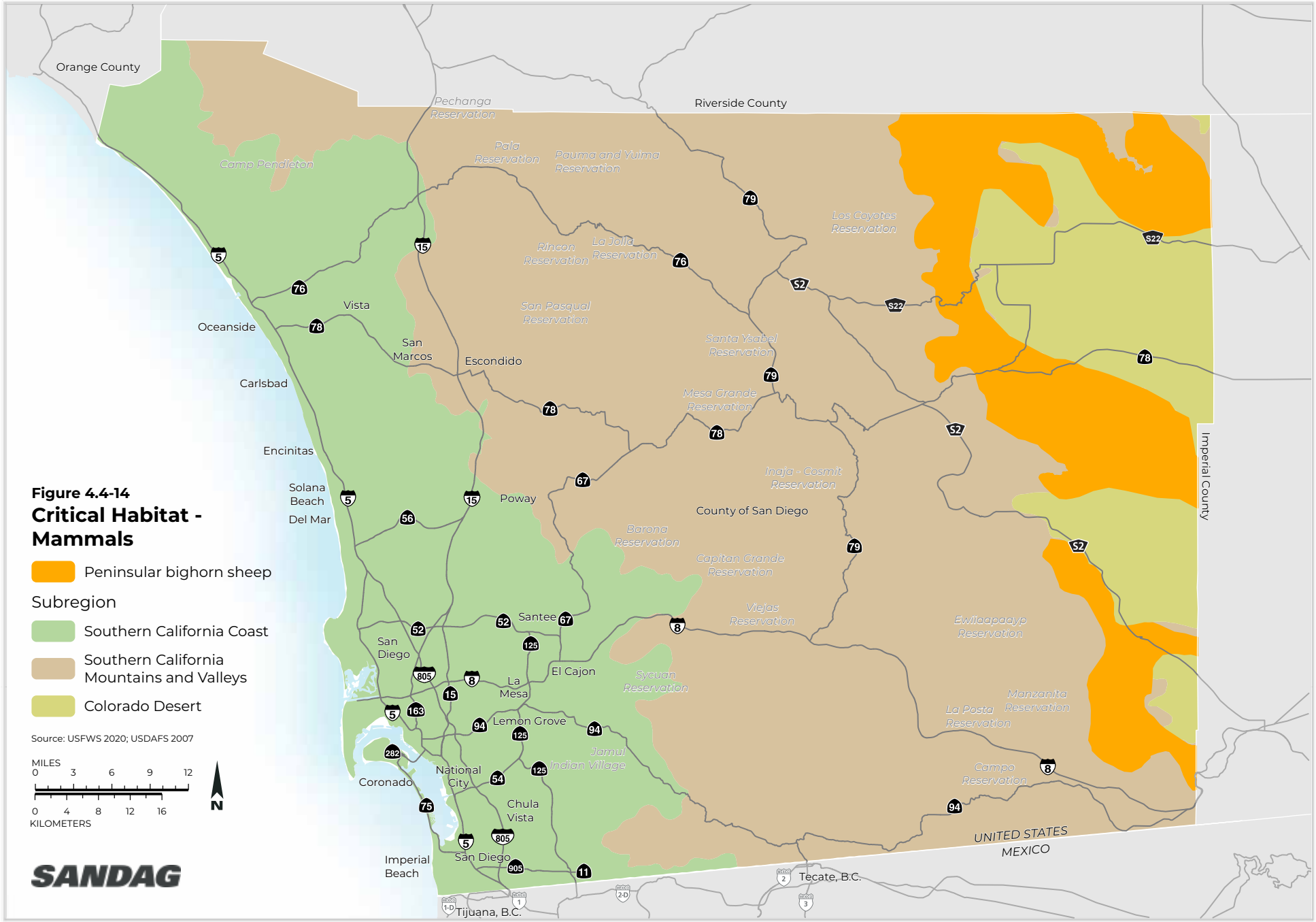
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Lemon Grove
National City
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Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.
Figure 4.4-14
Critical Habitat - Mammals
Peninsular bighorn sheep
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Source: USFWS 2020; USDAFS 2007
MILES
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Essential Fish Habitat

Essential Fish Habitat (EFH), which is defined as those "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC 1801 et seq.), is displayed on Figure 4.4-11. EFH in the San Diego region has been identified for federally managed fisheries of Pacific Coast groundfish and associated species, including rockfish, cabezon, California sheephead, ocean whitefish, and greenlings of genus Hexagrammos (NOAA 2015, CDFW 2017). The Southern Groundfish Management Area is defined as ocean waters between 34° 27' North latitude (from Point Conception, Santa Barbara County to the U.S./Mexico border) and areas designated as Habitat Areas of Particular Concern (HAPCs). Under the Pacific Coast Groundfish Fisheries Management Plan (FMP), HAPCs include estuary, seagrass, kelp canopy, and rocky reef.

WILDLIFE MOVEMENT

Wildlife movement may occur along landscape features (e.g., wildlife corridors, habitat linkages) that allow for species movement over time between two habitat patches that would otherwise be disconnected (Beier and Noss 1998, Lidicker and Peterson 1999, CBI 2003, Beier et al. 2008). For some species, such as the California gnatcatcher and other bird species, dispersal may also occur within line-of-sight along fragmented habitat patches (stepping stones) between larger habitat blocks (Bailey and Mock 1998).

Wildlife corridors contribute to population viability by (1) assuring continual exchange of genes between populations, which helps maintain genetic diversity; (2) providing access to adjacent habitat areas representing additional territory for foraging and mating; (3) allowing for a greater carrying capacity; and (4) providing routes for colonization of habitat lands following local population extinctions or habitat recovery from ecological catastrophes. Corridors also allow species to adapt to climate change because many habitats could lose their original value as the climate changes and force species range shifts into more hospitable areas or climates (National Fish, Wildlife and Plants Climate Adaptation Partnership 2012). Because many wildlife species have species-specific habitat requirements for survival and dispersal, corridors types and usage may be species specific.

A primary landscape features known to provide wildlife movement are ridgelines and drainages. Riparian corridors provide sufficient structural vegetative cover to allow the passage of many different types of wildlife. For some species, such as mountain lions, riparian habitat is often preferred for movement, and the presence of this habitat may reduce some of the negative impacts of roads as a deterrent for movement (Dickson and Beier 2002). In many parts of Southern California, the linear habitat provided by riparian corridors is the only habitat left providing connectivity to core areas or unfragmented habitat patches.

The Regional Plan, through land use and regional growth and climate adaptation and resiliency policies, intends to include wildlife movement corridors in the planned transportation network by conserving existing known corridors, identifying local corridors, and facilitating wildlife movement through project design.

Data Sources and Methods

The program-level description of existing conditions focuses on the qualitative and quantitative analysis of landscape level regional wildlife movement and habitat linkages rather than specific local corridors (e.g., small canyons, ephemeral drainages); the latter would be evaluated individually during project-level CEQA review. Regional corridors are described as a result of state-wide habitat connectivity modeling (Spencer et al. 2010) and in regional planning documents and regional studies, including the San Diego NCCP documents (City of San Diego 1998, SANDAG 2003, SCW 2008, Jennings 2020). Most of the regional data compiled as part of the state-

wide habitat connectivity model and the South Coast Wildlands Linkages modeling efforts are relatively coarse-scaled and were, therefore, not used for the analysis presented in this EIR. More finer-scaled models, including the MSCP cores and linkages maps (City of San Diego 1998) and the climate resilient wildlife movement models developed by San Diego State University (SDSU 2019), were used for the quantitative analysis described in this EIR. These modeled wildlife movement corridors in San Diego County are depicted on Figure 4.4-15. Additionally, cross-border linkages identified by the Las Californias Binational Conservation Initiative between the U.S. and Mexico, and the Pacific Flyway (a major regional north-south migration route for birds that travel between North and South America) are discussed qualitatively. Furthermore, the Audubon Society identifies, monitors, and protects Important Bird Areas (IBA). There are several IBAs located in San Diego County, including USFWS Wildlife Refuges, the Tijuana River Reserve, Mission Bay, all San Diego lagoons, and San Pasqual Valley, to name a few. Most of the areas in the study area are either not developable (i.e., lakes and bays) or are already conserved, and are included in the EIR's analysis.

Southern California Climate Resilient Connectivity Linkage Network

As part of developing a climate resilient connectivity strategy, a team of researchers from San Diego State University (SDSU), University of Washington, and Point Blue Conservation Science have identified landscape connectivity patches and corridors in the south coast ecoregion of Southern California (from Santa Barbara County to the international border between San Diego County and Mexico) to address threats of climate change, habitat fragmentation, and intensifying development (Jennings et al. 2020). Using a scenario-based approach, the team used available data to model species distribution (occurrence data) of five representative species and habitat connectivity to inform connectivity planning for a wide range of species and also account for climate change, land use shifts, and uncertainty. The models used an analytical process based on patch, linkage, and metapopulation modeling generated under historic (Year 2000) and future conditions. Linkage modeling used the GIS modeling approaches: least-cost corridor analysis, focal species flow models, and species geo-diversity land facet analysis (Jennings et al. 2013). The models were based on static representation of land use (note that this is a different data set than the data set that was used to model land use for the proposed Plan; see below) to incorporate any important linkages and corridors prior to development, and were prioritized using the Environmental Evaluation Management System, which is a GIS-based decision-making model. In the Southern California study area, over 55 percent of the multi-species linkage network is already conserved, and an additional 5 percent is on military and tribal lands with relative low possibility of development; therefore, just under 40 percent of the linkage network remains on unconserved lands (Jennings et al. 2020). The model output identifies a network of linkages and their conservation status, and provides the most recent comprehensively modeled connectivity corridors and linkages in San Diego County. However, the model is based on different land use data than the proposed Plan and the County General Plan. This may lead to an overestimation of impacts, because the model includes developed lands that would be impact-neutral.

SDSU's Institute for Ecological Monitoring and Management has published the GIS data for multi-species linkages and the Climate Resilient Connectivity Prioritized Linkages Network (SDSU 2019), which were used as the most current available information on wildlife corridors and linkages for the analysis in this EIR. The model output is provided on Figure 4.4-15.

Multiple Species Conservation Plan

The MSCP (City of San Diego 1998) identifies landscape-level biological linkages that serve to connect large tracts of core habitat within the MSCP South County Subarea (the southwestern portion of the San Diego region) study area and to areas outside the MSCP South County Subarea study area. These linkages generally are formed by river valleys or mesa tops in the coastal plain. At times the linkages, particularly those formed by

relatively narrow river valleys coursing through urbanizing areas, are identified as being constrained due to encroaching infrastructure or land development. Farther inland, the linkages become less constrained, as there is far less encroachment. A total of 24 linkages are identified, as shown in Figure 4.4-15.

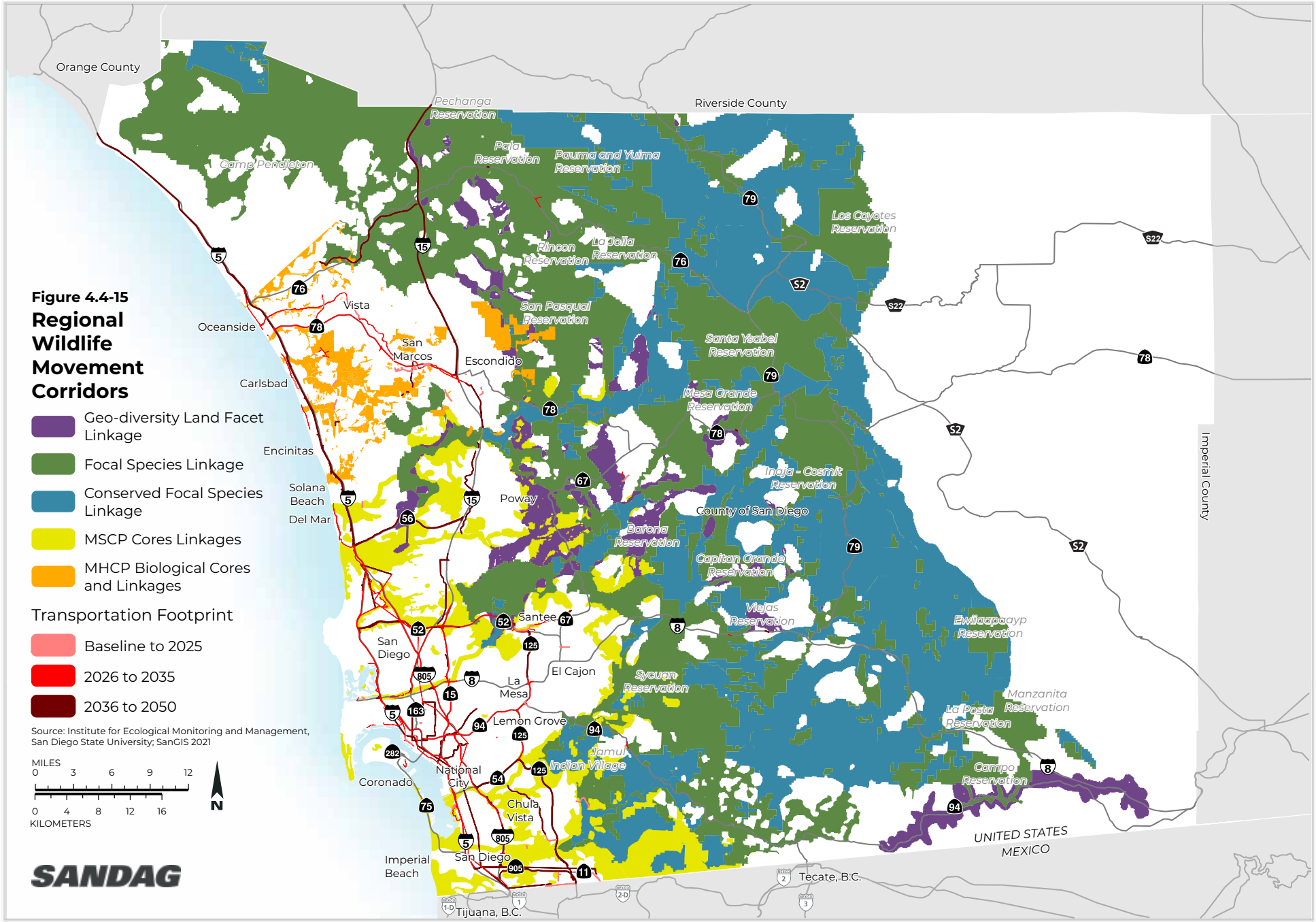


Figure 4.4-15
Regional Wildlife Movement Corridors
Geo-diversity Land Facet Linkage
Focal Species Linkage
Conserved Focal Species Linkage
MSCP Cores Linkages
MHCP Biological Cores and Linkages
Transportation Footprint
Baseline to 2025
2026 to 2035
2036 to 2050
Source: Institute for Ecological Monitoring and Management, San Diego State University; SanGIS 2021
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Camp Pendleton
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
El Cajon
San Diego
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.

These linkages are formed by various landscape features. Some are formed by westward-flowing drainages descending from the mountains and foothills. These consist of, from north to south, the San Dieguito River, Los Peñasquitos Creek, Poway Creek, the San Diego River, the Sweetwater River, and the Otay River. These and other drainages, including Santa Ysabel Creek, Dulzura Creek, and Cottonwood Creek, also provide linkages with core habitat outside the MSCP area. Additional linkages are formed by other diverse terrain features, such as the coastal mesa and ridgeline formed by Del Mar Mesa and Black Mountain and the foothills surrounding Poway Valley, as well as hilly terrain connecting various large blocks of inland habitat such as the ridges connecting San Miguel Mountain with Rancho del Rey and the foothills surrounding Otay Lakes to the north, east, and south (San Miguel Mountain, Sequan Peak, the Jamul Mountains, and Otay Mountain). Linkages to habitat areas outside of the MSCP area are provided by the hilly terrain north of Lake Hodges, Boden Canyon, the San Vicente River Valley, Long's Gulch, Lake Jennings, Wildcat Canyon, Dehesa Valley, Lyons Valley, and Marron Valley.

Multiple Habitat Conservation Plan

The MHCP is the Subregional Plan for the northwestern portion of the San Diego region (SANDAG 2003). The preserve design incorporated linkages between the coastal lagoons and inland habitat areas (generally east-west corridors associated with riparian habitats). North-south linkages consist of fragmented habitat that provides stepping-stone connectivity for avian species with limited dispersal abilities, such as the federally threatened coastal California gnatcatcher (Bailey and Mock 1998); the stepping stone concept was considered and is included in the modeling that resulted in the MHCP core and linkages maps. The matrix of urban and agriculture areas between the core habitats creates a major barrier for north-south movement of most terrestrial species. However, some large blocks of habitat inside the MHCP area (e.g., south San Marcos and north Escondido) are contiguous with larger blocks of habitat beyond the MHCP boundaries and provide habitat connectivity at a regional scale.

Las Californias Binational Conservation Initiative

The Las Californias Binational Conservation Initiative identified three important linkages along the international border with Mexico using a digital land cover Spatial Portfolio Optimization Tool (CBI 2004). These linkages connect the Sweetwater River and Otay River watersheds in the southern part of the San Diego region, the binational Tijuana River watershed, and the Rio Guadalupe watershed in Baja California (SCW 2008). The goal was to conserve the integrity and biological diversity of the Las Californias region across the coast-mountain-desert gradient and urban-wildland gradient.

Pacific Flyway

The San Diego region is part of the Pacific Flyway, a major north-south migration route for birds that travel between North and South America. In Southern California, this migratory pathway spans a broad front, and migrating birds are not uniformly distributed across the landscape. In the spring, many birds migrating from their winter range in western mainland Mexico to their breeding range in northern California, the Pacific Northwest, or Alaska use the San Diego region as a corridor for crossing from the desert to the coastal slope (Aspen 2008). Large numbers of waterfowl and shorebirds winter in San Diego's protected bays and lagoons, which contain shallow aquatic habitat used by many birds migrating along the Pacific Flyway. Conversely, raptors and other soaring birds typically follow mountain ridges during migration to take advantage of updrafts created by the topography.

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

The San Diego region is likely to experience a variety of climate change impacts that affect biological resources. These include sea-level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, a 12 percent decrease in runoff and streamflow due to less snowpack and greater evaporation, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, a longer and less predictable fire season, fewer coastal low clouds and less fog (marine layer), longer and more humid heat waves, and increased pests and pathogens as a result of drought (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018, Jennings et al. 2018). More details on future climate projections are available in Appendix C.

As discussed in Appendix C, during the timeframe of the proposed Plan, climate change effects are likely to have a substantial impact on biological resources. These effects include, but are not limited to, sea-level rise and associated flooding and saltwater intrusion, less frequent and more intense rainstorms, less coastal low clouds and fog (marine layer), changes in seasonality (precipitation regime variability, including summer rains and winter droughts), higher annual average temperatures, more days of extreme high temperatures, longer and more humid heat waves, and more intense and more frequent drought, increased frequency and severity of wildfires as a result of drought and shift in Santa Ana wind patterns, and increased pests and pathogens as a result of drought (Jennings et al. 2018). These types of changes can result in conditions that either stress biological resources resulting in lower fitness or productivity (i.e., higher temperatures may reduce plant growth or plant reproduction rates resulting in lower plant biomass and potentially lower soil carbon levels (Bradford et al. 2016, Hatfield and Prueger 2015, Ren et al. 2020) or may push organisms beyond their biological limits resulting in complete loss. While some biological resources may be able to adapt to changes, long-term climate trends may significantly affect the persistence of many species and their habitats in the San Diego region.

Climate change may result in significant impacts on biological resources, including adverse effects on habitats and wetlands, species health and productivity, and migratory pathways and timing. For example, a study of San Luis Obispo County found that sea-level rise along the coast could lead to increased erosion of coastal bluffs and beaches, coastal flooding, permanent inundation of coastal wetlands, and saltwater intrusion into freshwater supplies, all of which affect ecosystem health (Moser and Ekstrom 2012).

The combination of human-driven land use change and changing climatic conditions could negatively affect available habitat areas, including San Diego's scrublands and forests. As the habitat areas change, the species that depend on them could be negatively affected (USFWS 2010). More details on climate impacts on upland and inland habitat are available in Appendix C.

Sea-level rise, temperature, erosion, droughts, and precipitation-related flooding driven by climate change may all have far-reaching consequences for California's wetlands and riparian and coastal habitats (Griggs and Russell 2012). In riparian habitats, sea-level rise may increase saltwater intrusion into freshwater ecosystems, which may threaten species living in these environments (ICLEI 2012). Higher water temperatures in streams and estuaries, particularly in the San Diego region where water levels are relatively shallow, may cause thermal stress for species living there, making the habitat unsuitable (Jennings et al. 2018). Also, more frequent or intense drought conditions can change stream levels, particularly in areas with seasonal waterways like Southern California, which could damage riparian habitats (Hilberg et al. 2017, Jennings et al. 2018). The specific consequences of climate change on riparian habitats in the San Diego region have not been quantified. More details on climate impacts on riparian and coastal habitat are available in Appendix C.

The San Diego region is a recognized biodiversity hotspot, with more taxa of plants and mammals than any other county in the country (Jennings et al. 2018). Climate change is projected to compound environmental stressors from human-caused disturbances, habitat fragmentation, and landscape changes (Jennings et al. 2018). Changes such as warmer temperatures, more variable precipitation resulting in high intensity flooding, more frequent droughts, destructive fires, and sea-level rise could all affect species success. More details on climate impacts on species are available in Appendix C.

If habitats change and species face environmental stresses due to changing temperature and precipitation patterns, plant and animal species may migrate to new habitats. While animals can move rather quickly to new habitats, unless blocked by other factors, rapidly changing conditions may surpass the pace that vegetation can move. Some climates, such as alpine climates, could disappear entirely in the future, while desert climates could expand significantly (Moser et al. 2012). Some habitats may expand while others are lost (Moser et al. 2012). If there is no suitable habitat nearby, species will be unable to migrate. The extent to which habitat migration causes negative and/or positive impacts is unknown at this point, although studies tend to acknowledge risks to certain industries like agriculture or fishing. More details on climate impacts on migratory pathways are available in Appendix C.

4.4.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Federal Endangered Species Act

Administered by the USFWS and National Oceanographic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), the FESA provides the legal framework for the listing and protection of species (and their habitats) that are identified as being endangered or threatened with extinction. Pursuant to FESA (7 USC 136, 16 USC 1531 et seq.), USFWS and NMFS have regulatory authority over species listed as endangered or threatened as well as habitat of such species that has been designated as critical (i.e., Critical Habitat). Under FESA, authorization is required to "take" a listed species or adversely modify critical habitat. *Take* is defined under FESA Section 3 as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Under federal regulation (50 CFR 17.3, 222.102), *harm* is further defined to include habitat modification or degradation where it would be expected to result in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Designated critical habitat for endangered and threatened species is defined as a specific geographic area that is essential for species recovery and conservation of a threatened or endangered species and that may require special management and protection. Critical habitat is generally designated when a species is listed pursuant to the FESA. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. Critical habitat designations are not made for every species listed under FESA. The designation process also takes into account economic, national security, and other impacts and may result in the exclusion of some habitat areas from critical habitat designation (16 USC 1533(b)(2)). Military installations are generally excluded from critical habitat designations; however, they are required by the Sikes Act (16 USC 670a–670f, as amended) to prepare Integrated Natural Resource Management Plans (INRMPs).

Specifically, Sections 7 and 10(a) of the FESA regulate actions that could jeopardize endangered or threatened species. FESA Section 7 outlines procedures for federal interagency cooperation to conserve federally listed species and designated critical habitat. Section 7(a)(2) and its implementing regulations require federal agencies to consult with USFWS and/or NMFS to ensure that they are not undertaking, funding, permitting, or

authorizing actions likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of critical habitat.

For projects where federal action is not involved and take of a listed species may occur, the project proponent may seek to obtain an incidental take permit under FESA Section 10(a), which allows issuance of permits for incidental take of endangered or threatened species. The term "incidental" applies if the taking of a listed species is incidental to and not the purpose of an otherwise lawful activity. An HCP demonstrating how the taking would be minimized and what steps taken would ensure the species' survival must be submitted for issuance of Section 10(a) permits.

Sikes Act

Congress established the Sikes Act in 1960 to manage military lands for wildlife conservation and human access (16 USC 670 et seq.). The Sikes Act was amended in 1997 to require development and implementation of mutually agreed upon INRMPs through voluntary cooperative agreements between the Department of Defense (DOD) installations, USFWS, and the respective state fish and Wildlife Agencies (e.g., CDFW). INRMPs are planning documents used to implement planning, development, maintenance, and coordination of natural resource conservation and rehabilitation on military lands in consideration of the military's missions and obligations.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) domestically implements a series of international treaties that provide for migratory bird protection (16 USC 703 et seq.). The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds. The act provides that it is unlawful, except as permitted by regulations, "to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, […] any migratory bird, or any part, nest, or egg of any such bird" (16 USC 703(a)). Species protected under the MBTA are listed in 50 CFR 10.13. Most native birds in the San Diego region are protected under the MBTA. The USFWS issues permits under the MBTA to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, educational, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal; USFWS does not issue permits for "incidental take" of migratory birds that results from otherwise lawful activities such as infrastructure, transportation projects, facility structures, or other activities.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) is the primary law protecting eagles, including individuals, and their nests and eggs (16 USC 668 et seq.). It defines take to include "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb" (16 USC 668c). *Disturb* was defined by regulation at 50 CFR 22.3 in 2007 as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause… (1) injury to an eagle, (2) a decrease in productivity…, or (3) nest abandonment…"(USFWS 2009a). Under the BGEPA Eagle Permit Rule (50 CFR 22.26), USFWS may issue permits to authorize limited, non-purposeful take of bald eagles and golden eagles.

Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) of 1972 prohibits, with certain exceptions, the take of marine mammals. The MMPA defines take to mean the harassment, hunting, capture, or killing of any marine mammal, or attempt to harass, hunt, capture, or kill any marine mammal (16 USC 31). The primary authority for

implementing the act belongs to NMFS. Harassment is defined in 16 USC 1362 (18) as any act of pursuit, torment, or annoyance which:

- Has the potential to injure a marine mammal or marine mammal stock in the wild (Level A Harassment); or,
- Has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild (Level B Harassment).

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), establishes procedures designed to identify, conserve, and enhance EFH for those species regulated under a federal FMP. EFH is defined as those "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC 1801 et seq.). The Magnuson-Stevens Act also requires federal agencies to consult with NMFS on all actions or proposed actions permitted, funded, or undertaken by the agency that may adversely affect EFH.

NMFS encourages streamlining the consultation process by using review procedures under the National Environmental Policy Act (NEPA), Fish and Wildlife Coordination Act, CWA, and/or FESA provided the documents meet the requirements for EFH assessments under 50 CFR 600.920(e). EFH assessments must include (1) a description of the proposed action; (2) an analysis of effects, including cumulative effects; (3) the federal agency's views regarding the effects of the action on EFH; and (4) proposed mitigation, if applicable.

Marine Protection, Research, and Sanctuaries Act

In 1972, Congress enacted the Marine Protection, Research, and Sanctuaries Act (MPRSA) (also known as the Ocean Dumping Act). Permitting standards under the MPRSA prohibit the dumping of material into the ocean that would unreasonably degrade or endanger human health or the marine environment (16 USC 1431 et seq.; 33 USC 1401 et seq.; 40 CFR 227). MPRSA regulates the ocean dumping of all material beyond the territorial limit (3 miles from shore) and prevents or strictly limits dumping material that "would adversely affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities." Virtually all material ocean dumped today is dredged material (sediments) removed from the bottom of waterbodies in order to maintain navigation channels and berthing areas.

Ocean dumping cannot occur unless a permit is issued pursuant to Section 103 of the MPRSA (33 USC 1413), which authorizes USACE to issue permits, subject to U.S. Environmental Protection Agency (EPA) approval, for transport and disposal of dredged material (e.g., material excavated from navigable U.S. waters) at designated ocean disposal sites. For other materials, EPA is the permitting agency. EPA is also responsible for designating recommended ocean dumping sites for all types of materials.

Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 (RHA) (33 USC 403), administered by the USACE, requires USACE authorization for structures in, over, or under navigable waters of the U.S. or the accomplishment of

work affecting the course, location condition or capacity of navigable waters of the U.S. *Navigable waters of the U.S*. generally describes those waters that are subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. *Work* typically includes any dredging or disposal of dredged material, excavation, filling, or other modification of navigable waters of the U.S. *Structure* typically refers to any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial reef, permanent mooring structure, power transmission line, or any other obstacle or obstruction. Typical activities requiring authorization pursuant to Section 10 of the RHA are construction of piers, wharves, bulkheads, dolphins, marinas, ramps, floats, intake structures, and cable or pipeline crossings, as well as dredging and excavation.

Section 9 of the Rivers and Harbors Act

Section 9 of the RHA (33 USC 491) prohibits the construction of any bridge, dam, dike or causeway over or in navigable waterways of the U.S. without Congressional approval. The United States Coast Guard (USCG) administers Section 9 and issues permits under the General Bridge Act (see below) over navigable waters. Navigable waters that require a USCG bridge permit are defined as "(1) tidal and used by recreational boating, fishing, and other small vessels 21 feet or greater in length or (2) used or susceptible to use in their natural condition or by reasonable improvement as a means to transport interstate or foreign commerce." It is to the discretion of the USCG to determine the navigability of these waters.

General Bridge Act of 1946

The USCG administers the Bridge Administration permit process. A USCG bridge permit is needed for the construction, reconstruction, or modification of any bridge or causeway across navigable waters of the U.S. A bridge is usually defined as the entire span plus footings, typically from abutment to abutment. For the purposes of bridge permitting, a navigable waterway is defined as any waterway that is subject to tidal action or is presently used or could be used for the transport of interstate or foreign commerce. The USCG issues bridge permits under the authorities of both Section 9 of the RHA (see above), and the General Bridge Act of 1946. In cases when the USCG issues a bridge permit, authorization from the USACE pursuant to Section 10 of the RHA is not required. However, authorization pursuant to Section 404 of the CWA may still be required. The issuance of a bridge permit is relevant to biological resources because it would constitute a federal action, subject to NEPA (42 USC 4321–4347, as amended) that would trigger Section 7 consultation if federally listed endangered or threatened species are present, and consultation with NMFS should EFH be present.

Clean Water Act

The principal law that serves to protect the nation's waters is the 1948 Federal Water Pollution Control Act. This legislation, more commonly referred to as the Clean Water Act (CWA), underwent significant revision when Congress, in response to the public's growing concern of widespread water pollution, passed the Federal Water Pollution Control Act Amendments of 1972. The purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of all waters of the U.S. for the conservation of the nation's potable water sources. Since the enactment of the CWA the definition of waters of the U.S. has undergone several revisions and updates. On April 21, 2020 the EPA and USACE published the Navigable Waters Protection Rule in the Federal Register to finalize a revised definition of waters of the U.S. under the CWA. The rule became effective on June 22, 2020. At the time for Draft EIR preparation, the WOTUS rule was being litigated in several lawsuits, including State of California et al. v. Wheeler (N.D. Cal, Case No. 3:20-cv-3005). In June 2021, the USACE and EPA announced their intention to replace the 2020 WOTUS rule with a broader definition of waters

of the U.S. At that time, the Department of Justice filed a motion requesting remand of the Navigable Waters Protection Rule (EPA 2021).

The 2020 definition defines four categories of waters of the U.S. as well as identifies several waters and/or features that are excluded from the definition of waters of the U.S. Most notably, the 2020 definition excludes ephemeral features, including streams that only support surface water flows in direct response to precipitation. The 2020 definition of waters of the U.S. supersedes the 1986 and 2015 definitions of waters of the U.S. Section 404 of the CWA (33 USC 401 et seq.; 33 USC 1344; 33 USC 1413; and DoD, Department of the Army, USACE 33 CFR 323), as implemented by the USACE, requires authorization by the USACE for the discharge of dredged and/or fill material into waters of the U.S. (as defined at 33 CFR 328.3(a)). *Dredged material* means material that is excavated or dredged from waters of the U.S. *Fill material* means material placed in waters if the U.S. where the material has the effect of replacing any portion of a waters of the U.S. with dry land or changing the bottom elevation of waters of the U.S. Examples of fill material include rock, sand, soil, clay, plastics, woodchips, concrete, and materials used to create any structure or infrastructure in waters of the U.S.

Section 401 of the CWA requires a water quality certification or waiver thereof before any federal permit can be issued "to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge." Therefore, projects requiring authorization by the USACE pursuant to Section 404 of the CWA and/or Section 10 of the RHA may need to obtain water quality certification. California's State Water Resources Control Board (SWRCB) and RWQCBs, and the EPA are responsible for issuing Section 401 Water Quality Certifications.

Coastal Zone Management Act

The Federal Consistency Unit of the California Coastal Commission (CCC) implements the federal Coastal Zone Management Act (CZMA) of 1972, Section 307 (c)(1) as amended, for federal activities, development projects, permits, licenses, and support to state and local governments. In the CZMA, Congress created a federal and state partnership for management of coastal resources as the primary federal law enacted to preserve and protect coastal resources (33 USC 1451 et seq.). The federal CZMA, as amended, requires that federal actions that affect any land or water use or natural resource of a state's coastal zone be consistent, to the maximum extent practicable, with the enforceable policies of a federally approved state coastal zone management plan. The California Coastal Management Program, which includes the California Coastal Act (CCA) of 1976, is the federally approved coastal zone management plan for California.

Regulatory authority, including federal consistency review, is granted to the CCC. One of the most significant provisions of the federal CZMA gives state coastal management agencies regulatory control (federal consistency review authority) over all federal activities and federally licensed, permitted, or assisted activities, wherever they may occur (i.e., landward or seaward of the respective coastal zone boundaries fixed under state law) if the activity affects coastal resources.

Executive Order 11988, Floodplain Management

Executive Order (EO) 11988 requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. This EO provides an eight-step process that agencies carry out as part of their decision-making process for projects that have potential impacts on or within a floodplain.

Executive Order 11990, Protection of Wetlands

Pursuant to EO 11990, each federal agency is responsible for preparing implementing procedures for carrying out the provisions of the EO. The purpose of this EO is to "minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands." Each agency, to the extent permitted by law, must avoid undertaking or providing assistance for any activity located in wetlands, unless the head of the agency finds that there is no practical alternative to such activity, and the proposed action includes all practical measures to minimize harm to wetlands that may result from such actions.

Executive Order 13112, Invasive Species

EO 13112 requires federal agencies to "prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health effects that invasive species cause." An *invasive species* is defined by the EO as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." *Alien species* are defined, with respect to a particular ecosystem, as any species (including its seeds, eggs, spores, or other biological material capable of propagating that species) that is not native to that ecosystem.

Executive Order 13186, Migratory Birds

EO 13186 requires federal agencies to develop a comprehensive strategy for the conservation of migratory birds by the federal government, thereby fulfilling the government's duty to lead in the protection of this international resource. Each federal agency is required to enter into a Memorandum of Understanding (MOU) with USFWS outlining how the agency will promote conservation of migratory birds. The EO also requires federal agencies to incorporate migratory bird conservation measures into their agency activities. The EO does not affect federal-aid projects because actions delegated to or assumed by nonfederal entities, or carried out by nonfederal entities with federal assistance, are not subject to the EO, although such actions continue to be subject to the MBTA itself.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

California Endangered Species Act

The California Endangered Species Act (CESA) provides a process by which plants and animals can be recognized as being endangered or threatened with extinction. Pursuant to the CESA, a permit from CDFW is required for projects that could result in the taking of a plant or animal species that is State listed as threatened or endangered (CFGC Section 2050 et seq.). Under CESA, *take* means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill (CFGC Section 86). The CESA definition of take does not include "harm" or "harass," as the FESA definition does. As a result, the threshold for take is higher under CESA than under FESA. Authorization for take of state-listed species may be obtained through a CFGC Section 2080.1 consistency determination (for applicants who have already obtained a federal incidental take statement or permit for the same species) or a Section 2081 Incidental Take Permit.

Natural Community Conservation Planning Act

The NCCP Act of 1991, amended 2003, is a federal and State cooperative effort to engage in regional multiple species conservation planning. The ESA Section 4(d) special rule for interim take of coastal California gnatcatchers was promulgated in response to California's NCCP Act of 1991 and the initiation of NCCP plans targeting coastal sage scrub (gnatcatcher habitat). NCCPs provide regional or area-wide protection of plants

and animals, reconcile urban development and wildlife needs, "conserve" state-listed species to the point where they can be delisted, and maintain or enhance conditions for covered species such that listing will not become necessary (CFGC Section 2800 et seq.). The NCCP Act was amended again in 2011 to allow CDFW to authorize incidental take of "fully protected" species if they are "covered species" under an ~~approved~~ adopted NCCP.

California Fish and Game Code Section 1602 – Lake or Streambed Alteration

CDFW regulates alterations to or impacts on streambeds or lakes under Section 1602 of the CFGC. All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by CDFW under CFGC Section 1602. Under Section 1602, it is unlawful for any person, governmental agency, or public utility to do the following without first submitting a complete Notification of Lake or Streambed Alteration to CDFW:

- Substantially divert or obstruct the natural flow of, or substantially change or use any material from, the bed, channel, or bank of any river, stream, or lake.
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The California Fish and Game Commission defines *stream* as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This definition includes watercourses with a surface or subsurface flow that supports or has supported riparian vegetation. CDFW's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. CDFW requires a Streambed Alteration Agreement (SAA) for projects that would result in an impact on a river, stream, or lake; divert or obstruct the natural flow of water; change the bed, channel, or bank of any stream; or use any material from a streambed. The SAA is a contract between the applicant and CDFW stating what activities can occur in the riparian zone and stream course.

California Fish and Game Code Sections 3503 and 3503.5 – Protection of Birds, Nests, and Raptors

CFGC Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (i.e., species in the orders Falconiformes and Strigiformes), including their nests or eggs. Typical violations of these codes include destruction of active nests resulting from removal of vegetation in which the nests are located. Violation of Section 3503.5 could also include failure of active raptor nests resulting from disturbance of nesting pairs by nearby project construction. These code sections do not provide for the issuance of any type of incidental take permit.

Fully Protected Species under the California Fish and Game Code (California Fish and Game Code Sections 3511, 4700, 5050, and 5515)

Protection of fully protected species is described in CFGC Sections 3511, 4700, 5050, and 5515. These statutes prohibit take or possession of fully protected species. Incidental take of fully protected species may be authorized under an ~~approved~~ adopted NCCP.

California Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (CFGC Section 1900 et seq.) directed CDFW to carry out the legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA gave

the California Fish and Game Commission the power to designate native plants as "endangered" or "rare," and to protect endangered and rare plants from take.

Porter-Cologne Water Quality Control Act – California Water Code Section 13000 et seq.

The SWRCB and RWQCBs, as appropriate, have the responsibility to implement and enforce the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), which regulates waste discharge into waters of the state. Porter-Cologne grants the RWQCBs the authority to implement and enforce the water quality laws, regulations, policies, and plans to protect the groundwater and surface water of the state. The RWQCB regulates the "discharge of waste" to waters of the state. *Discharge of waste* is also broadly defined in Porter-Cologne, such that discharges of waste include fill, any material resulting from human activity, or any other "discharge" that may directly or indirectly impact waters of the State relative to implementation of Section 401 of the CWA.

Under Porter-Cologne, all parties proposing to discharge waste that could affect the quality of waters of the state, other than into a community sewer system, are required to file with the appropriate RWQCB a Report of Waste Discharge (ROWD) containing such information and data as may be required by the RWQCB. The RWQCB will then respond to the ROWD by issuing a waste discharge requirement (WDR) in a public hearing, or by waiving WDRs (with or without conditions) for that proposed discharge.

The RWQCB collaborates with other agencies on the enforcement of the act, such as CDFW and USACE. Generally, when staff issue or waive 401 certification, WDRs are simultaneously waived. However, for large or multiyear projects that are being reviewed under Section 401 of the CWA, staff may determine that WDRs should also be issued, whereby additional review by the RWQCB and a public hearing will be necessary.

On April 2, 2019, the SWRCB adopted a State wetland definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (Procedures), which became effective on May 28, 2020. The SWRCB developed the Procedures to address multiple issues, including the need to strengthen protections of waters of the state that are not protected under CWA due to past Supreme Court Rulings. The Procedures define an area as a wetland if it meets three criteria: wetland hydrology, wetlands substrate, and wetland plants. The State wetland definition varies slightly from the federal definition to account for wetlands in arid portions of the state and clarifies that under normal circumstances an area may be a wetland even if it lacks wetland vegetation. The Procedures further clarify when a wetland is a water of the state. In light of the 2020 waters of the U.S. rule, wetlands that are no longer regulated under the CWA will likely remain waters of the state requiring issuance of a WDR. In December 2020, a Sacramento trial court enjoined SWRCB implementation of the Procedures due to errors in the adoption process. The SWRCB responded to several legal challenges and approved a resolution on April 6, 2021 to apply the Procedures to waters of the state as a matter of State policy for water quality control. Therefore, the Porter-Cologne Act continues to require WDRs for discharges to waters of the state, as implemented through the 2019 Procedures as revised on April 26, 2021.

California Coastal Act

Pursuant to California Public Resource Code Section 30000 et seq., the CCC regulates coastal resources within the coastal zone under jurisdiction of the CCA (as amended). The coastal zone is identified as the land and water area of the State of California extending seaward to the state's outer limit of jurisdiction (3 miles offshore) including all offshore islands, and extending inland generally 1,000 yards from the mean high tide line of the sea. In significant coastal estuarine habitat and recreational areas it extends inland to the first major ridgeline paralleling the sea or 5 miles from the mean high tide line of the sea, whichever is less, and in developed urban areas the zone generally extends inland less than 1,000 yards.

The CCC, through provisions of the CCA, is authorized to issue a Coastal Development Permit (CDP) for projects located within the Coastal Zone. In areas where a local entity has a certified Local Coastal Program (LCP), the local entity can issue a CDP only if it is consistent with the LCP. The CCC, however, has permit and appeal authority for portions of LCPs and retains jurisdiction over certain public trust lands and in areas without an LCP (CCC 1994).

With respect to biological resources, Section 30240 of the CCA states that Environmentally Sensitive Habitat Areas (ESHAs) "shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas." It further states that development in areas adjacent to ESHAs and parks and recreation areas must be sited and designed to prevent impacts that would significantly degrade those areas, and must be compatible with the continuance of those habitat and recreation areas. Section 30233 of the CCA addresses the diking, filing, or dredging of open coastal waters, wetlands, estuaries.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

Natural Community Conservation Planning Program and Habitat Conservation Plans

California's NCCP Program focuses largely on conserving large areas of native habitat and the habitats that link those areas to help preserve California's native fauna and flora at the landscape and regional levels. While NCCPs are governed by the California NCCP Act, the FESA requires the issuance of HCPs. NCCPs and HCPs are prepared to be compliant with the requirements under CESA, the NCCP Act, the NPPA, and Section 10(a)(1)(B) of FESA, respectively. NCCPs and HCPs may be combined to provide take authorization under federal and State law.

The following sections describe approved and adopted Subarea or Subregional Plans under the NCCP within the San Diego region. Conflicts with unapproved or unadopted plans do not require analysis under CEQA (see CEQA Guidelines Section 15125(d)(e)). In March 2021, the County of San Diego reinstated the Planning Agreement with the USFWS and CDFW for the North and East County MSCP plans (County of San Diego 2021a). The reinstatement sets the parameters, goals, and completion schedule for both plans, which will include impacts on aquatic resources under federal and State jurisdictions. Under the interim project processing guidelines outlined in the Planning Agreement, the County of San Diego considers impacts on the proposed preserve design of the Draft North County MSCP (County of San Diego 2019) during the projects' CEQA process to ensure that proposed projects are consistent with the preliminary conservation objectives and do not compromise the successful completion of the plans. These NCCPs are included in Appendix E-4.

Multiple Species Conservation Program

The MSCP (City of San Diego 1998) was approved in August 1997~~8~~ as a cooperative effort by the City of San Diego, County of San Diego, and other jurisdictions in the southwestern San Diego region to implement a regional NCCP and HCP (see Table 4.4-5)~~; the updated document was printed~~ the document was updated in 1998. The MSCP serves as an umbrella document for local jurisdictions that implement their portions of the MSCP Plan through subarea plans. The MSCP subarea plans contribute collectively to the landscape-level conservation of vegetation communities and species in the MSCP study area by identifying contiguous preserves and setting conservation goals and schedules. Entities with ~~approved~~ adopted subarea plans employ a tracking system that tracks habitat gains and losses over time toward their conservation goals, which are included in annual reports for each subarea plan. Annual reports are available to the public.

The USFWS and CDFW have issued ~~a~~ permits (50-year permit term) to five of the nine jurisdictions within the MSCP plan boundary. ~~incidental take authorization through planning permits (Implementing Agreements, IA), the signatories to which included multiple agencies.~~ The cities of Chula Vista, La Mesa, Poway, and San Diego (City of San Diego 1997), and the County of San Diego (South County) have adopted subarea plans under the County of San Diego MSCP and have developed municipal guidelines and ordinances to implement their subarea plans. The cities of Coronado, Del Mar, El Cajon, and Santee do not have ~~approved~~ adopted subarea plans under the MSCP (the City of Santee is currently preparing a subarea plan for approval), thereby requiring project-based regulatory approvals under FESA and CESA.

The City of San Diego, in response to the revocation of federal coverage under the City's MSCP Subarea Plan for vernal pool species, has developed a VPHCP (City of San Diego 2017) covering seven threatened and endangered vernal pool species, including five plant and two crustacean (fairy shrimp) species. The VPHCP provides take authorization for these species and expands the City's existing MHPA to conserve additional vernal pools. The VPHCP also includes a Management and Monitoring Plan to provide for long-term protection, management, and enhancement of vernal pool habitat and the seven covered species.

The County of San Diego developed the South County MSCP Subarea Plan (County of San Diego 1997) to cover all unincorporated areas of the County south of Lake Hodges. The MSCP Subarea Plan identified ~~hardline preserves~~MSCP Preserves, which include those areas that were negotiated to be preserve land prior to or concurrently with the approval of the South County MSCP Subarea Plan; and soft-line preserve areas that are identified to contain future preserved lands as part of the Plant's conservation cores and linkages. The County of San Diego is also currently finalizing the North County MSCP, which includes lands within the unincorporated County that are not covered under the MHCP or South County MSCP. While the County is not yet implementing the North County MSCP, it has completed the conservation design and identified priority areas for conservation that are being considered in the CEQA analysis of development projects within the North County MSCP planning area. While a planning effort for the eastern portions of the San Diego region was considered by the County of San Diego in 2008, the East County MSCP planning efforts have slowed because of staffing constraints. Preliminary conservation design has been completed for this area and has identified focused areas for conservation that are considered during CEQA analysis of development projects, as described above for the North County. Neither the North County nor the East County MSCPs have been adopted.

While the County is not yet implementing the North County MSCP, it has developed a preserve system consisting of hardline and softline preserves (Pre-Approved Mitigation Area [PAMA]) that is being considered in the CEQA analysis of development projects within the North County MSCP planning area. While a planning effort for the eastern portions of the San Diego region was considered by the County of San Diego in 2008, the East County MSCP planning efforts have slowed because the majority of the eastern San Diego region is occupied by federal lands (e.g., U.S. Forest Service and Bureau of Land Management) and already receives an appreciable degree of conservation under federal laws, ordinances, and guidelines.

In March 2021, the County of San Diego reinstated their planning agreement with the USFWS and CDFW regarding the North and East County MSCPs. The planning agreement includes milestones for the finalization of the MSCPs and a draft covered species list. ~~The plans also intend to cover wetland habitats, in contrast to the other approved adopted NCCPs that are limited to upland habitats.~~ The North County MSCP's adoption is anticipated in 2024.

A summary of ~~approved~~ adopted subarea plans under the County of San Diego MSCP Subregional Plan is provided in Table 4.4-5. Regional habitat conservation planning areas and conserved lands are illustrated on Figure 4.4-16.

Multiple Habitat Conservation Program

The MHCP is an NCCP and HCP for the northwestern portion of the San Diego region (cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista) and was approved by the SANDAG Board of Directors on March 28, 2003 (SANDAG 2003). The MHCP encompasses 111,908 acres (29,962 acres of natural habitat) and provides conservation for 77 species in a 20,593-acre reserve. Similar to the MSCP, the MHCP serves as an umbrella document for local jurisdictions that implement their respective portions of the MHCP through subarea plans. The MHCP subarea plans contribute collectively to the conservation of vegetation communities and species in the MSCP study area. The MHCP also received a 50-year IA from USFWS and CDFW; gains and losses to the overall preserve system is tracked similarly as those for the MSCP.

On November 15, 2004, the City of Carlsbad HMP was approved, and State and federal permits were issued. The cities of Encinitas, Escondido, Oceanside, San Marcos, and Vista do not have ~~approved~~adopted subarea plans under the MHCP. The City of Encinitas implements an Open Space Management Plan that identifies local conservation goals pursuant to the MHCP. The City of Oceanside in collaboration with the USFWS and CDFW implements the Oceanside Draft MHCP Subarea Plan through the City's plan check approvals (City of Oceanside pers. comm. 2018, 2021). The City of Solana Beach does not require take authorizations and therefore did not prepare a subarea plan. The status of the subarea plans under the MHCP is summarized in Table 4.4-5. Regional habitat conservation planning areas and conservation lands are illustrated on Figure 4.4-16.

Table 4.4-5
Summary of Approved or Implemented Subarea Plans Under Adopted MSCP/MHCP Subregional Plans in the San Diego Region

Plan	Effective Date	Description
City of San Diego MSCP Subarea Plan	1997	The subarea plan encompasses 206,124 acres and was approved in July 1997. The City of San Diego's Subarea Plan developed an MHPA that delineates core biological resource areas and corridors targeted for conservation. Specific policies and directives have been developed for different areas within the MHPA, which is largely composed of core biological resource areas and regional linkages leading to biological core areas within existing reserves and parks. The MHPA covers approximately 56,831 acres, of which 90 percent will be preserved for biological purposes.
City of San Diego Vernal Pool Habitat Conservation Plan (VPHCP)	2018	~~In October of 2009, the City and USFWS entered into a Planning Agreement for the development of an HCP covering vernal pool habitats and associated species in the City.~~ The Vernal Pool HCP was developed as a response to legal action that removed all vernal pool–associated covered species from the City's MSCP Subarea Plan. The VPHCP was finalized in 2017, approved by the City in January of 2018, and permitted by ~~CDFW and~~ USFWS ~~(Wildlife Agencies)~~ in August 3, 2018. It covers the same plan area as the City's MSCP Subarea Plan.

Plan	Effective Date	Description
County of San Diego (South County) MSCP Subarea Plan	1997	The County subarea is located in the eastern part of the MSCP Subregion. The subarea encompasses 252,132 acres (184,248 acres is habitat), of which 101,268 acres will be conserved. The County MSCP Subarea Plan was approved by the Wildlife Agencies in March 1998. Three segments are included in the plan: Lake Hodges, South County, and Metro-Lakeside-Jamul. ~~The County of San Diego requested an amendment for Otay Ranch in 2020, and is also pursuing a major amendment to add the Quino checkerspot butterfly as a covered species to the southern subarea. An administrative draft amendment has been reviewed by the Wildlife Agencies.~~
City of Chula Vista MSCP Subarea Plan	2005	This subarea plan covers approximately 57,828 acres and seeks to preserve 5,000 acres within the city's jurisdiction, while 4,200 acres outside the city's jurisdiction is proposed for preservation. The plan will preserve approximately 9,201 acres. Approved in 2003, the Final MSCP Subarea Plan was completed in 2005.
City of La Mesa MSCP Subarea Plan	2000	Remaining habitat in this subarea consists largely of coastal sage scrub, and all losses will be mitigated elsewhere. Approved in 1999, permits were issued in 2000.
City of Poway MSCP Subarea Plan	1996	The City of Poway MSCP Subarea Plan provides for incidental take coverage for 43 plant and animal species. It encompasses 35,000 acres and establishes a 13,300-acre mitigation area. This was the first subarea plan approved under the Subregional MSCP.
City of Carlsbad Habitat Management Plan (HMP) – MHCP Subarea Plan	2004	On November 15, 2004, the City of Carlsbad HMP was approved, and State and federal permits were issued to implement the city's MHCP. The Carlsbad Subarea Plan is the first to be approved and permitted under the MHCP Subregional Plan. The subarea encompasses 24,570 acres (8,758 acres is habitat). At build-out, the preserve system is expected to cover approximately 6,786 acres, consisting mostly of natural upland and wetland habitats, including coastal sage scrub, chaparral, oak woodland, riparian scrub, riparian forest, freshwater marsh, and grasslands. The Carlsbad Subarea Plan provides for the conservation of 43 species.

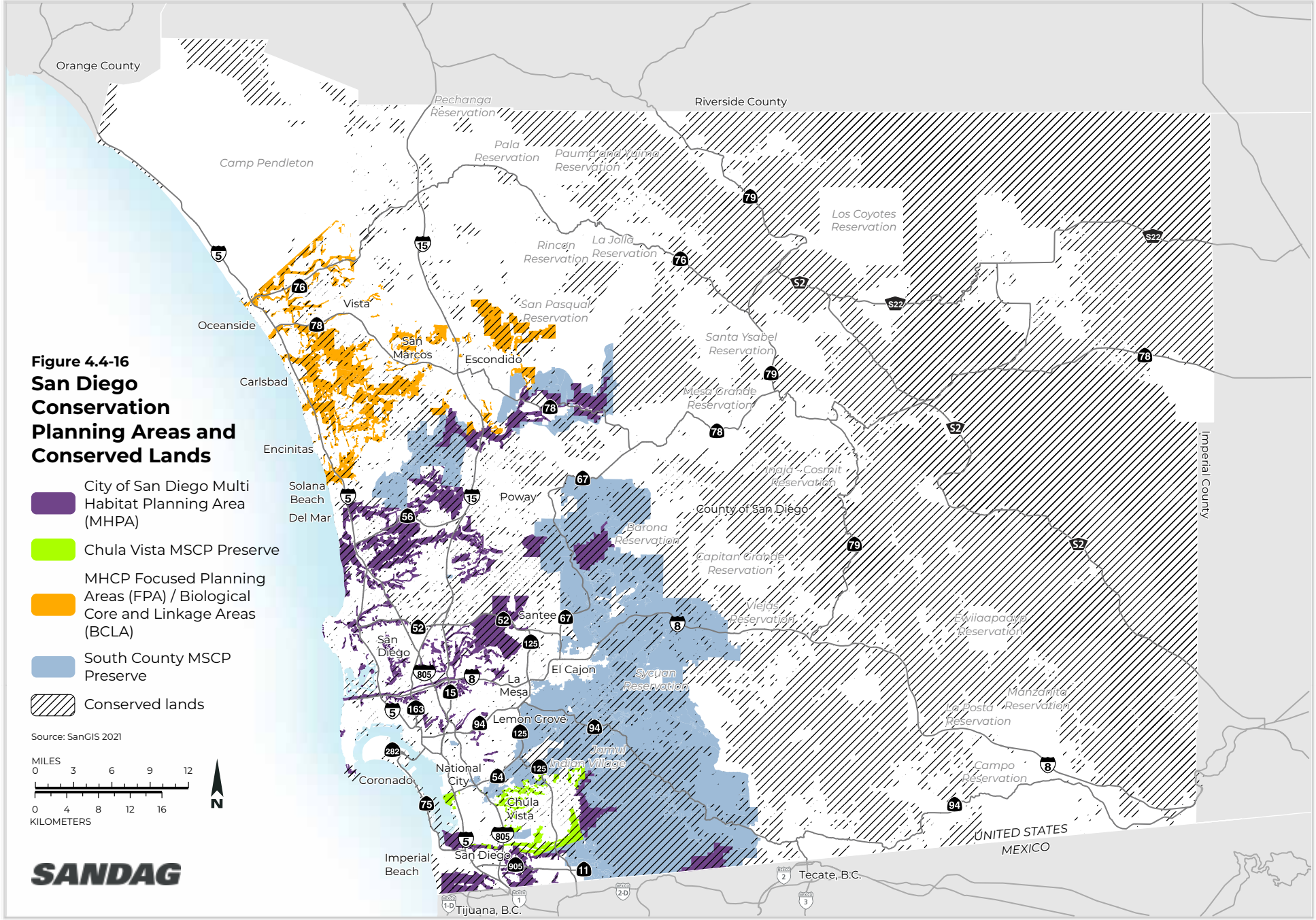


Figure 4.4-16
San Diego Conservation Planning Areas and Conserved Lands
City of San Diego Multi Habitat Planning Area (MHPA)
Chula Vista MSCP Preserve
MHCP Focused Planning Areas (FPA) / Biological Core and Linkage Areas (BCLA)
South County MSCP Preserve
Conserved lands
Source: SanGIS 2021
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma Yuima Reservation
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Chula Vista
National City
Coronado
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
El Cajon
La Mesa
Lemon Grove

San Diego County Water Authority Natural Community Conservation Plan/Habitat Conservation Plan

The San Diego County Water Authority (SDCWA) adopted a combined NCCP/HCP (SDCWA 2011) to address potential impacts on sensitive resources associated with new construction and typical expansion of existing infrastructure; ongoing installation, use, maintenance, and repair of its aqueduct and water conveyance, treatment, and storage systems; and acquisition of new and management/monitoring of all existing Preserve Area lands throughout the plan area. The plan area covers approximately 992,000 acres in western San Diego and southwestern Riverside counties. The implementing agreement for the plan was issued by USFWS and CDFW on September 28, 2011. The plan covers 28 plant species and 38 wildlife species for a total of 66 covered species. Of the approximately 1,920 acres of preserve area committed to be conserved by the plan, 1,220 acres have been set aside as compensation for previously permitted projects and approximately 700 acres are available or will be created to be used as credits to compensate for project impacts on upland and wetland habitats. In addition, the SDCWA has previously conserved 1,147 acres of regionally important habitat lands (i.e., Managed Mitigation Areas) that contribute to the baseline of conservation within the plan area.

San Diego Gas & Electric Subregional NCCP

In 1995, San Diego Gas & Electric (SDG&E 1995) developed the first NCCP in the region for linear projects and specified operation and maintenance activities in SDG&E's service area from southern Orange County south to the Mexican border. The NCCP covers 110 plant and animal species and emphasizes avoidance of impacts, while establishing mitigation requirements that may include revegetation or use of mitigation credits set aside in several land parcels purchased by SDG&E as a conservation bank. SDG&E's properties and easements play an important role in the NCCP region in providing habitat connectivity in areas where little natural habitat remains. The NCCP authorizes up to 400 acres of permanent and temporary impacts on habitat for covered species; an amendment would be required to authorize additional take. SDG&E received approval of a low-effect HCP for Quino checkerspot butterfly (*Euphydryas editha quino*) in 2008. On March 15, 2017, the USFWS issued permit no. TE26660C-0, which included an additional 60 acres and extended the permit term by 5 years (USFWS 2017). The USFWS and CDFW are coordinating with SDG&E on an amendment to their HCP/NCCP.

TransNet Environmental Mitigation Program

An important component in regional conservation planning is the *TransNet* Extension Ordinance and Expenditure Plan, which was approved countywide by voters in November 2004 and includes the Environmental Mitigation Program (EMP) administered by SANDAG. The EMP consists of direct mitigation of planned transportation projects and the regional habitat acquisition, management, and monitoring activities necessary to implement ongoing regional habitat conservation planning efforts (SANDAG 2019. The EMP is a collaborative effort among SANDAG, the cities, the County, the Wildlife Agencies (CDFW and USFWS), and other regulatory agencies (CCC, USACE, EPA, and RWQCB) and representatives of various stakeholder groups, including the environmental community and the science/technical community (SANDAG 2019). The EMP provides funding for the acquisition, restoration, and management costs associated with mitigation for impacts on habitat resulting from regional and transportation projects and local streets and road, and for the implementation of the local NCCPs.

The San Diego Management and Monitoring Program (SDMMP), established in 2008, facilitates and assists SANDAG, local jurisdictions, Wildlife Agencies, and other regional stakeholders and land managers in the implementation of conservation management and monitoring within the San Diego region. This region-wide

effort was created to implement long-term management strategies identified in the San Diego NCCPs and is partially funded through SANDAG's EMP. The SDMMP's goal is to assist with the alignment of regional efforts to implement activities identified in the Management Strategic Plan (MSP, SDMMP 2017). The MSP identifies priority species, and has developed and is currently developing, best management practices (BMPs) and protocols for sensitive plants and animals, wildlife movement, fire management, and grazing management.

Local Jurisdiction General Plan Policies and Ordinances

Local jurisdictions have adopted ordinances or general plan policies to protect and preserve open space, trees, sensitive habitats, and waters and wetlands. The County of San Diego has promulgated biological protection ordinances, regulations, and guidelines, including the BMO for implementing the South County MSCP Subarea Plan; the RPO for regulating impacts on sensitive biological resources and wetlands; the HLP Ordinance pursuant to the Special 4(d) Rule under FESA (50 CFR 17.41(b)); and the Zoning Ordinance that applies specific restrictions and provisions.

Several ordinances or regulations, such as the City of Chula Vista's Habitat Loss and Incidental Take regulations, and the City of San Diego's Land Development Code for Environmentally Sensitive Lands and accompanying Biology, Steep Hillside, and Coastal Bluffs and Beaches Guidelines, are used to implement their respective city's adopted subarea plans. Local jurisdictions have general plan policies and various resource protection ordinances that must be addressed on a project-specific level and may result in added level of protection of biological resources.

Table 4.4-6
Relevant General Plan Policies and Biological Resource Protection Ordinances in the San Diego Region by Local Jurisdiction

Ordinance/General Plan	Purpose
Carlsbad	
Chapter 21.210, Habitat Preservation and Management Requirements	Preserve the diversity of natural habitats and unique biological resources in Carlsbad through implementing the goals and objectives of the land use and the open space/conservation elements of the City of Carlsbad General Plan and the City's HMP under the MHCP (see Table 4.4-5); and the regulations for development review.
Chapter 21.203, Coastal Resource Protection Overlay Zone	Preserve, protect, and enhance the habitat resource values; provide regulations in areas that provide the best wildlife habitat characteristics; deter soil erosion; and implement conservation of sensitive habitats and the approved Carlsbad local coastal program.
Chapter 21.95, Hillside Development Regulations	When grading occurs, assure that alteration of natural hillsides is done in an environmentally sensitive manner to reduce impacts on lagoons, riparian systems, wildlife habitats, and native vegetation.
Chapter 21. 33, Open Space Zone	Provide for open space and recreational uses. This zone also protects areas preserved as natural habitat and the biological resources located in the areas in conformance with the Carlsbad HMP.
Chapter 21.45, Planned Developments	Provides a method for clustered property development on environmentally and topographically constrained land.
Chapter 20.22, Environmental Subdivisions	Provides provisions for perpetual maintenance of the habitat and that perpetual easement will be recorded that prohibits construction of improvements except for those specifically identified.

Ordinance/General Plan	Purpose
Chapter 15.16, Grading and Erosion Control	Requires compliance with grading regulations, protection of public facilities, protection of adjacent property, and preservation of adjacent environmental resources from impacts of the grading operation.
Chapter 21.42, Minor Conditional Use Permits and Conditional Use Permits	Guides the minor use permit process including the application of a biological habitat preserve.
General Plan	The Open Space, Conservation, and Recreation Element of the Carlsbad General Plan contains Goal 4-G.3, which aims to protect environmentally sensitive lands, wildlife habitats, and sensitive plant and animal communities; and Policy 4-G.4, which aims to promote conservation of hillsides and ridgelines. Policies 4-P.9 through 4-P.19 include habitat and open space conservation policies.
Chula Vista	
Chapter 17.30, Otay Ranch Grazing	Implements the Otay Ranch general development plan and resource management plan within Chula Vista.
Chapter 17.35, Habitat Loss and Incidental Take	Protect and conserve native habitat within Chula Vista and the viability of the species supported by those habitats.
Chapter 19.86, Bayfront Specific Plan - Environmental Management Program	Reduce and mitigate impacts on the refuge from new development within the Bayfront.
General Plan	The Environment Element of the Chula Vista General Plan contains Policy E 1.1 to implement the MSCP Subarea Plan, and Policy E 5.3 to ensure that approved mining reclamation plans fully comply with applicable requirements regarding the restoration of biological habitats and the creation of trails and parkland.
Coronado	
Chapter 86.38, Open Space Zone	Provides for the protection and preservation of open space areas within Coronado that are unique due to natural resources, visual amenities, public safety purposes, or recreational opportunities.
Chapter 86.64, Wildlife Preserve Zone (Modifying Overlay Zone)	Protect and preserve valuable and unique environmental resources for the enjoyment and benefit of present and future generations of Californians.
Chapter 86.72, Diking, Dredging, Filling, and Dredge Spoils Disposal	Require that diking, dredging, filling, and dredge spoils disposal in open coastal waters and wetlands require City of Coronado issuance of a coastal permit.
Chapter 86.76, Protection of Natural Ocean and Bay Processes	Requires the issuance of a coastal permit from the City for the construction or placement of any improvement that may significantly affect the natural erosion process resultant from the interaction of water bodies upon their shores, or cause significant adverse alteration of the bay or ocean environment.
Chapter 61.04, Stormwater and Urban Runoff Management Program	Establishes requirements for the management of stormwater flows from development projects, both to prevent erosion and to protect and enhance existing water-dependent habitats.
Chapter 61.08, Discharge Regulations and Requirements	Implement post-construction best management practices for permanent control of erosion from slopes, including structures to convey water, vegetation to stabilize disturbed slopes, and velocity controls.
General Plan	The Open Space and Conservation Elements of the Coronado General Plan contain objectives to protect biological resources, natural resources, wildlife, and promote habitat preservation.

Ordinance/General Plan	Purpose
Del Mar	
Chapter 30.53, Lagoon Overlay Zone	Protects the wetland resources of these lagoon areas and their sensitive upland habitats by requiring that all development activities are designed and implemented in a manner that is consistent with wetland habitat protection and enhancement.
Chapter 30.52, Bluff, Slope, and Canyon Overlay Zone	Protects downstream resources from the adverse impacts of erosion and sedimentation.
Chapter 23.50, Trees	Encourages conservation of trees and the application of management techniques to create a healthy, diverse urban forest.
Chapter 23.33, Land Conservation Ordinance	Regulates soil disturbances of existing or natural terrain and vegetation and does not create soil erosion, silting of lower slopes, slide damage, flooding problems, or severe cutting or scarring.
General Plan	The Del Mar Community Plan contains objectives to preserve or restore habitat and biological resources.
El Cajon	
Chapter 17.155, O-S (Open Space) Zone	Protect and preserve open space land as a limited and valuable resource, permit a reasonable use of open space while preserving and protecting inherent open space characteristics, and implement the open space provisions of the general plan.
Chapter 16.60, Standard Urban Stormwater Mitigation Plan	Require a drainage study report prepared by a registered civil engineer of downstream conditions following field reconnaissance, including the susceptibility to erosion or habitat alteration from altered flow.
General Plan	The City of El Cajon General Plan does not contain policies or regulations specific to biological resources.
Encinitas	
Chapter 23.24, Grading, Erosion, and Sediment Control	Establishes minimum requirements for grading, excavating and filling of land, to provide for the issuance of grading permits.
General Plan	The Resource Management Element of the Encinitas General Plan contains policies to preserve significant mature trees, vegetation, and wildlife habitat.
Escondido	
Chapter 33-3, Open Space Zone	To implement the open space/conservation element of the general plan and the public lands/parks land use designation, while also including protection of unique or rare plant and/or animal habitat.
Chapter 33-75: San Dieguito River Valley Focus Planning Area	Establishes appropriate design guidelines and provides for comprehensive planning of the San Dieguito River Valley Focus Planning Area in conjunction with general plan policies and preservation of significant natural resources.
Chapter 33-55, Grading and Erosion Control	Ensures that development occurs in a manner that protects the natural and topographic character and identity of the environment.
Chapter 33-5: Open Space Development Standards	Establishes standards for the development of lands identified by the open space/conservation element of the general plan.
General Plan	Policy 5.6 of the Land Use and Community Form Element and Biological and Open Space Resources Policies 1.1 through 1.12 of the Resource Conservation Element of the Escondido General Plan aim to protect biological resources. In addition, as stated in the Land Use and Community Form Element of the General Plan, core themes including,

Ordinance/General Plan	Purpose
	"smart growth principles [that] represent a shift in focus from how to development vacant land to how to reinvest in existing neighborhoods."
Imperial Beach	
Chapter 19.29, OS Open Space Zone	Provides for land set aside for the protection of sensitive and fragile natural resources. This zone is intended to limit and control access and intensity of uses in these areas. This zone applies to the Tijuana River Valley.
General Plan	The City of Imperial Beach General Plan and Local Coastal Plan contain Policies 4.3.1 through 4.3.5 to protect, restore, and enhance the viability of key coastal habitats and species.
La Mesa	
Chapter 24.09, Scenic Preservation Overlay Zone	To retain and incorporate into each proposed development natural topography, vegetation, and scenic features of the site.
General Plan	The Recreation and Open Space Element of the La Mesa General Plan contain policies and conservation objectives to preserve and restore open space and natural features consistent with the City's Habitat Conservation Plan.
Lemon Grove	
Chapter 18.08, Grading and Excavating	Ensures that development occurs in a manner that protects environmentally sensitive areas as defined as areas designated as Areas of Special Biological Significance by the SWRCB and the RWQCB.
General Plan	The Conservation and Recreation Element of the Lemon Grove General Plan contains Policy 3.1, which aims to limit impacts on biological habitats.
National City	
Chapter 18.28, Open Space Reserve Zone	To provide a use category to uses shown in the open space and conservation element of National City's general plan and local coastal program.
Chapter 18.27, Open Space Zone	To provide for public and private improved and unimproved open space.
General Plan	The Open Space and Agriculture Element of the National City General Plan contains Policies OS-1.1 through OS 1.4, which protect and conserve the landforms and open spaces that serve as core biological areas and wildlife linkages, or are wetland habitats; encourage the removal of invasive plant species and the planting of native plants; and limits development of open spaces; and Policies OS-2.1 through OS-2.8, which require the preservation of sensitive habitat areas.
Oceanside	
Chapter 6, Building Construction Regulations	Section 6.44 includes provisions for flood hazard reduction
General Plan	The Environmental Resource Management Element of the Oceanside General Plan contains implementation strategies and policies for preservation of natural resources.
Poway	
Chapter 12.32, Urban Forestry	Sets forth all tree-related policies, regulations, and generally accepted standards on public property and public rights-of-way. Maintains the practice of protecting native trees and heritage trees.

Ordinance/General Plan	Purpose
Chapter 17.24, OS-RM Open Space - Resource Management Zone	This zone is intended for lands where valuable natural resources are located. The mountainous areas, prominent ridges, riparian areas, wildlife corridors, areas of high biological value, areas with geologic hazards, and areas with valuable historic and prehistoric resources are included within this zone.
General Plan	The Natural Resources Element of the City of Poway General Plan identifies biological resources within the City.
City of San Diego	
Chapter 14, General Regulations; Article 2, General Development Regulations; Division 4, Landscape Regulations	Minimize the erosion of slopes and disturbed lands through revegetation; conserve energy by the provision of shade trees; conserve water; reduce the risk of fire; and improve the appearance of the built environment by increasing the quality and quantity of landscaping.
Chapter 13, Zones; Article 2, Overlay Zones; Division 6, Sensitive Coastal Overlay Zone	Help protect and enhance the quality of sensitive coastal bluffs, coastal beaches, and wetlands.
Chapter 14, General Regulations; Article 3, Supplemental Development Regulations; Division 1, Environmentally Sensitive Lands Regulations	To protect, preserve and, where damaged restore, the environmentally sensitive lands of San Diego and the viability of the species supported by those lands. Includes development regulations for Environmentally Sensitive Lands to serve as standards for the determination of impacts and mitigation. These standards also serve to implement the City's MSCP by placing priority on the preservation of biological resources within the MHPA, as identified in the City of San Diego Subarea Plan (see Table 4.4-5).
General Plan	The Conservation Element of the City of San Diego General Plan includes the goal for the preservation and long-term management of spaces that serve as core biological areas and wildlife linkages. Policy CE-B.1 protects and conserves important landforms, canyon lands, and open spaces; and Policy CE-B.2 applies the appropriate zoning and regulations to limit development of floodplains and sensitive biological areas.
San Marcos	
Chapter 18.04, Environmental Protection	Provides for enhancement and protection of the environment within the city by establishing principles, objectives, criteria, definitions, and procedures for evaluation of the environmental impact of public and private projects in an orderly manner.
Chapter 23.330, Water Efficient Landscape Standards	Establishes that landscape plans must address all BMPs, coincide with grading plans, address brush management Zones, and address biological constraints.
Chapter 20.260, Ridgeline Protection and Management Overlay Zone	To interface with Biological Reserves/Subarea Plan (Focused Planning Areas) Preserved Design. All development within the zone must be consistent with the city's Multiple Habitat Conservation/Subarea Plan.
General Plan	The City of San Marcos General Plan, in the Conservation Element, includes Policies COS-1.1 to support the protection of biological resources; COS 1.2 to ensure that new development maintain the value of sensitive biological habitats and COS 1.3 to continue to implement SANDAG's MHCP; COS-2.2 to limit the conversion of open space to urban uses; and COS-2.6 to preserve healthy mature trees where feasible.

Ordinance/General Plan	Purpose
Santee	
Chapter 13.22.040, Hillside Overlay District	Maintain natural open space character; protect natural land forms; minimize erosion; provide for public safety; protect water, flora, and fauna resources; and establish design standards to provide for limited development in harmony with the environment.
General Plan	The Conservation Element of the Santee General Plan includes Policies 2.1 through 2.7 and Policies 7.1 through 7.4 to protect biological resources.
Solana Beach	
Chapter 17.40, Open Space/Recreation Zone	Preserve, protect, and enhance the value of natural resources including topographical and geological features, plant and wildlife habitats, coastal wetlands, beaches, coastal bluffs, watershed areas, resource buffer areas, and scenic areas.
Chapter 17.42, Open Space/Preserve	Preserve and protect open space; scenic views; the natural environment; and habitat for aesthetic, conservation, and ecological purposes.
Chapter 18.04, Environmental Protection	Provide for enhancement and protection of the environment within the city by establishing principles, objectives, criteria, definitions, and procedures for evaluation of the environmental impact of public and private projects in an orderly manner.
General Plan	The City of Solana Beach Municipal Code contains Objective 5.0 to preserve important biological habitat and protect sensitive, rare, and endangered species of flora and fauna. Policies 5.a through 5.f identify specific requirements to protect biological resources.
Local Coastal Program – Land Use Plan	The land use policies in the City of Solana Beach map ESHA and identify policies to protect ESHAs. ESHAs shall be protected against any significant disruption of habitat values, and development in areas adjacent to ESHAs and parks and recreation areas shall be sited and designed to prevent impacts.
Vista	
Chapter 15.04, Environment	To implement CEQA and the CEQA Guidelines for the city by applying the provisions and procedures contained in CEQA to development projects proposed within the city.
Chapter 18.15, BPO Biological Preserve Overlay Zone	Establishes the biological preserve overlay zone to protect valuable natural resources in accordance with the provisions of the MSCP, ensure that development minimizes disturbance to sensitive natural habitats, as feasible, and enhance or improve natural resources.
General Plan	The City of Vista General Plan contains policies specific to Resource Conservation and Sustainability (RCS) Element Goal 5 to preserve and protect the range of natural biological communities and species native to the City and region, and conserve viable populations of key sensitive species and their habitats; RCS Goal 6 to implement the provisions of the regional MHCP; and RCS Goal 7 to conserve, enhance, and restore open space areas.
County of San Diego	
Chapter 5, Biological Mitigation Ordinance	Protects the County's biological resources and prevents their degradation and loss by guiding development outside of biological resource core areas, and by establishing mitigation standards. Chapter 5 also enables the County of San Diego to achieve the conservation goals set forth in the Subarea Plan for the MSCP.

Ordinance/General Plan	Purpose
Chapter 6, Resource Protection Ordinance	Protects sensitive lands and prevents their degradation. Chapter 6 also preserves and protects the County's unique topography, natural beauty, diversity, and natural resources.
General Plan	The San Diego County General Plan includes several policies in the Conservation and Open Space (COS) Element related to the protection of biological resources. Policies COS-1.1 through COS-1.11 relate to a regionally managed, inter-connected preserve system; Policies COS-2.1 and COS-2.2 are related to sustainable ecosystems; and Policies COS-3.1 and COS-3.2 ensure protection and enhancement of wetlands.
Subregional Plan for the Otay Ranch	Implements the Otay Ranch general development plan and resources management plan within the County of San Diego.

Sources: City of Carlsbad 2015, 2021; City of Chula Vista 2005, 2021; City of Coronado 2003, 2021; City of Del Mar 1976, 2021; City of El Cajon 2001, 2021; City of Encinitas 1995, 2021; City of Escondido 2012, 2021; City of Imperial Beach 2019, 2021; City of La Mesa 2013, 2021; City of Lemon Grove 2015, 2021; City of National City 2011, 2021; City of Oceanside 2002, 2021; City of Poway 1991, 2020; City of San Diego 2015, 2021; City of San Marcos 2021, 2021; City of Santee 2003, 2021; City of Solana Beach 2014, 2020; City of Vista 2012, 2021; County of San Diego 2015, 2021b.

4.4.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the CEQA Guidelines Appendix G checklist questions. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, and the unique characteristics of the proposed Plan.

Checklist questions for biological resources are provided in Section IV (a–f) of CEQA Guidelines Appendix G. To better focus the potential impacts associated with the proposed Plan, the CEQA Guidelines Appendix G questions have been combined and modified. Specifically, checklist questions (b) and (c), which address impacts on sensitive natural communities and protected aquatic resources, are addressed in BIO-1. Question (a), effects on special-status species, is addressed in BIO-2. Question (d), effects on migration and wildlife nurseries, is addressed in BIO-3. Questions (e) and (f), conflicts with local policies, ordinances, or habitat conservation plans, are addressed in BIO-4.

Therefore, implementation of the proposed Plan would have a significant biological resources impact if it would:

BIO-1 Have a substantial adverse effect on any sensitive natural communities identified in local or regional plans, policies, regulations, or by CDFW or USFWS; or have a substantial adverse effect on state or federally regulated waters and wetlands through direct removal, filling, hydrological interruption, or other means.

BIO-2 Have a substantial adverse effect, either directly or indirectly, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or listed by CDFW or USFWS, including their federally designated critical habitat, or species that are considered sensitive in CEQA Guidelines Section 15380.

BIO-3 Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

BIO-4 Conflict with the provisions of an adopted HCP, NCCP, or other conservation plan, or with any local policies or ordinances protecting biological resources.

4.4.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

GENERAL ANALYSIS METHODS

This analysis examines whether regional growth and land use change or planned transportation network improvements would physically displace or alter biological resources. Direct impacts are evaluated using GIS methods by overlaying transportation improvement project footprints (i.e., area encompassing permanent and temporary land disturbance) and regional growth and land use change onto the baseline biological datasets identified in Analysis Methodology subsections for each significance criterion (BIO-1 through BIO-4) below. The analysis evaluates permanent and temporary direct and indirect impacts as defined in Chapter 4, *Environmental Impact Analysis*.

- *Direct*: Direct impacts are caused by the project and occur at the same time and place as the project.
- *Indirect*: Indirect impacts may have an effect later in time or are farther removed in distance but are still reasonably foreseeable and attributable to project-related activities.
- *Permanent*: All impacts that result in irreversible effects or removal of biological resources are considered permanent.

  Temporary: Any impacts considered to have reversible effects on biological resources may be viewed as temporary. The period of time under which an impact would be viewed as "temporary" will vary by habitat type, project context, and local regulations. As a general rule, impacts are considered temporary only if timely efforts would ensure the impact is corrected to conditions equal to or superior to the conditions that existed prior to impact.

BIO-1 **HAVE A SUBSTANTIAL ADVERSE EFFECT ON ANY RIPARIAN HABITAT OR OTHER SENSITIVE NATURAL COMMUNITYIES IDENTIFIED IN LOCAL OR REGIONAL PLANS, POLICIES, REGULATIONS, OR BY CDFW OR USFWS ; OR HAVE A SUBSTANTIAL ADVERSE EFFECT ON STATE OR FEDERALLY REGULATED WATERS AND WETLANDS THROUGH DIRECT REMOVAL, FILLING, HYDROLOGICAL INTERRUPTION, OR OTHER MEANS**

ANALYSIS METHODOLOGY

Direct Impacts

Direct impacts on sensitive natural communities and regulated aquatic resources are quantified using the GIS methods outlined below. Direct impacts include permanent and temporary impacts. Temporary impacts were not analyzed using GIS methods as they are not known until project-specific plans are prepared that identify such temporary impact areas as equipment staging, trenching, etc.

Regional Growth and Land Use Change

Regional growth and land use change impacts are evaluated by identifying the extent of currently undeveloped areas (2021~~17~~ data) that are occupied with sensitive vegetation communities and regulated aquatic resources and that would be converted to developed land uses for each horizon year. Polygon layers from the land use layers up to years 2025, 2026 through 2035, and 2036 through 2050 that include all developed land use

categories are created in GIS. The developed land use layers are overlaid on the baseline vegetation layer (see Section 4.4.1, *Existing Conditions/Sensitive Vegetation Communities*) to determine the areas that would be converted from undeveloped to developed land uses for each horizon year.

Regional growth and land use impacts are quantified based on two categories of land use: spaced rural residential land use and all other developed land uses. Impacts from these two categories are summed together to present an estimate of the total impact from regional growth and land use. Rural residential land use impacts were quantified by determining the maximum portion of those areas that would be developed based on required MSCP, MHCP, General Plan, County Guidelines, and respective identified mitigation ratios. The adopted NCCPs and their subarea plans contain percentages of the amount of land to be conserved[5] within identified preserve categories. All ~~hardline preserves~~MSCP Preserves are considered 90–100 percent conserved. Softline preserves and Subarea Plan preservation areas (including the MHPA for the City of San Diego MSCP, Focused Planning Area [FPA], and Biological Core and Linkage Area [BCLA] for the MHCP, PAMA, and Major and Minor Amendment areas for the County MSCP) were assigned a range of conservation values. For the purpose of the programmatic evaluation of this EIR, ~~all~~ softline and Subarea Plan preserves were assigned a 50–75 percent conservation value. Pursuant to County of San Diego Guidelines, single family residential development within the unincorporated areas of the County on parcels of 10 acres or less within the PAMA were considered 80 percent conserved, and outside the PAMA 50 percent conserved. All other developed land use categories are considered 100 percent developed; that is, the entire parcel would be considered permanently converted from its previous condition to fully developed, with no habitat value. Some preserve designations, specifically the MHCP FPA, the City of Chula Vista MSCP Preserve, and City of San Diego MHPA, have varying degrees of conservation percentages. For the purpose of this programmatic analysis, the most conservation percentages were used, resulting in an overestimation of impacts. This is a conservative approach and assumes that impacts on sensitive vegetation communities would be mitigated at approved offsite mitigation banks, which has become common practice in San Diego County. The rationale and detailed methodology to quantify impacts for each category are described below. Appendix E-5 details which land use classifications are categorized as undeveloped and developed (i.e., spaced rural residential land use and other developed land uses) for purposes of this EIR.

Development under the spaced rural residential land use designation occurs at a much lower density than other developed areas. The majority of this type of development occurs within the unincorporated county and is subject to County of San Diego ordinances that restrict development to varying degrees; none set a limit on the amount of parcel or lot that can be developed with the exception of those areas covered by the South County and North County MSCPs. Habitat mitigation ratios or conservation levels, determined by MSCP guidance or County of San Diego Guidelines for Determining Significance for Biological Resources, ultimately limit the amount of habitat that can be developed within the unincorporated areas.

Other developed land use areas, (i.e., not designated spaced rural residential) would also require mitigation for biological resources impacts, but development in these areas typically occurs at a higher density than spaced

[5] The term "conserved" reflects the projected conservation of habitats and biological resources as identified in the HCPs. Hard-line preserves cannot be developed and impacts will be avoided. When allowed development occurs in other preserve dedications such as the PAMA, FPA, or MHPA, the conservation component required by the respective HCP will be implemented through the dedication of conservation easements or other site protection instruments that require the conservation, management, and monitoring of the conserved resources in perpetuity.

rural residential lands. All assumptions detailed above may overestimate biological resources impacts on vegetation communities and regulated aquatic resources because exact conservation and mitigation measures can only be quantified once a specific site and footprint has been identified and evaluated against conservation and mitigation requirements identified in plans, policies and ordinances.

Transportation Network Improvements and Programs

Sensitive vegetation community and regulated aquatic resources impacts are evaluated through GIS by overlaying transportation improvement project footprints onto the baseline vegetation dataset described in Section 4.4.1. Transportation improvement project vegetation impacts are calculated for each project that requires new construction in undeveloped areas. Transportation improvement project footprints are based on what is known about planned transportation network improvements contained in the proposed Plan at the time of analysis (see Appendix B). Refer to Section 4.2, *Agricultural and Forestry Resources*, for a detailed discussion regarding the development of the transportation network footprint used for this analysis.

Indirect Impacts

Indirect impacts that may occur on sensitive vegetation communities and regulated aquatic resources in proximity to areas experiencing regional growth and land use change and/or transportation network improvements cannot be quantified because they may be project-specific and are not always foreseeable. They are, therefore, qualitatively analyzed on a broad scale.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Direct Impacts

Regional growth and land use change is associated with ground disturbance resulting from the construction of housing, employment centers, transportation, and other infrastructure development and expansion. Ground-disturbance is synonymous with direct impacts on biological resources. Implementation of the proposed Plan would cause adverse impacts on sensitive natural communities and regulated aquatic resources. Direct impacts are those resulting in damage to or removal of vegetation from the direct actions of construction within the actual permanent or construction footprint and include impacts from grading, paving, structures, clearing and grubbing, landscaping, staging and access routes, or similar activities. Fuel management zones, as long as placed outside an open space preserve or conservation area, are considered impact neutral by the City and County of San Diego.

Any permanent or temporary impacts on the sensitive vegetation communities described in Section 4.4.1 would be considered significant. Impacts on vegetation communities that do not meet the definition of sensitive would not be considered significant Implementation of the proposed Plan would also directly impact regulated aquatic resources described in Section 4.4.1.

Direct impacts on regulated aquatic resources would occur from removal, filling, hydrological changes, or other disturbance to these resources. However, impacts would be quantified on a project-specific level based on jurisdictional delineation and concurrence from regulatory agencies, which would also include the determination of the type of aquatic resource, including whether the resource would be considered ephemeral,

intermittent, or permanent. Estimated direct impacts on sensitive vegetation communities and regulated aquatic resources due to regional growth and land use change between 2016 and 2025 are identified in Table 4.4-7.

Table 4.4-7
Estimated Direct Impacts on Sensitive Vegetation Communities and Regulated Aquatic Resources Within the San Diego Region (acres) up to Year 2025

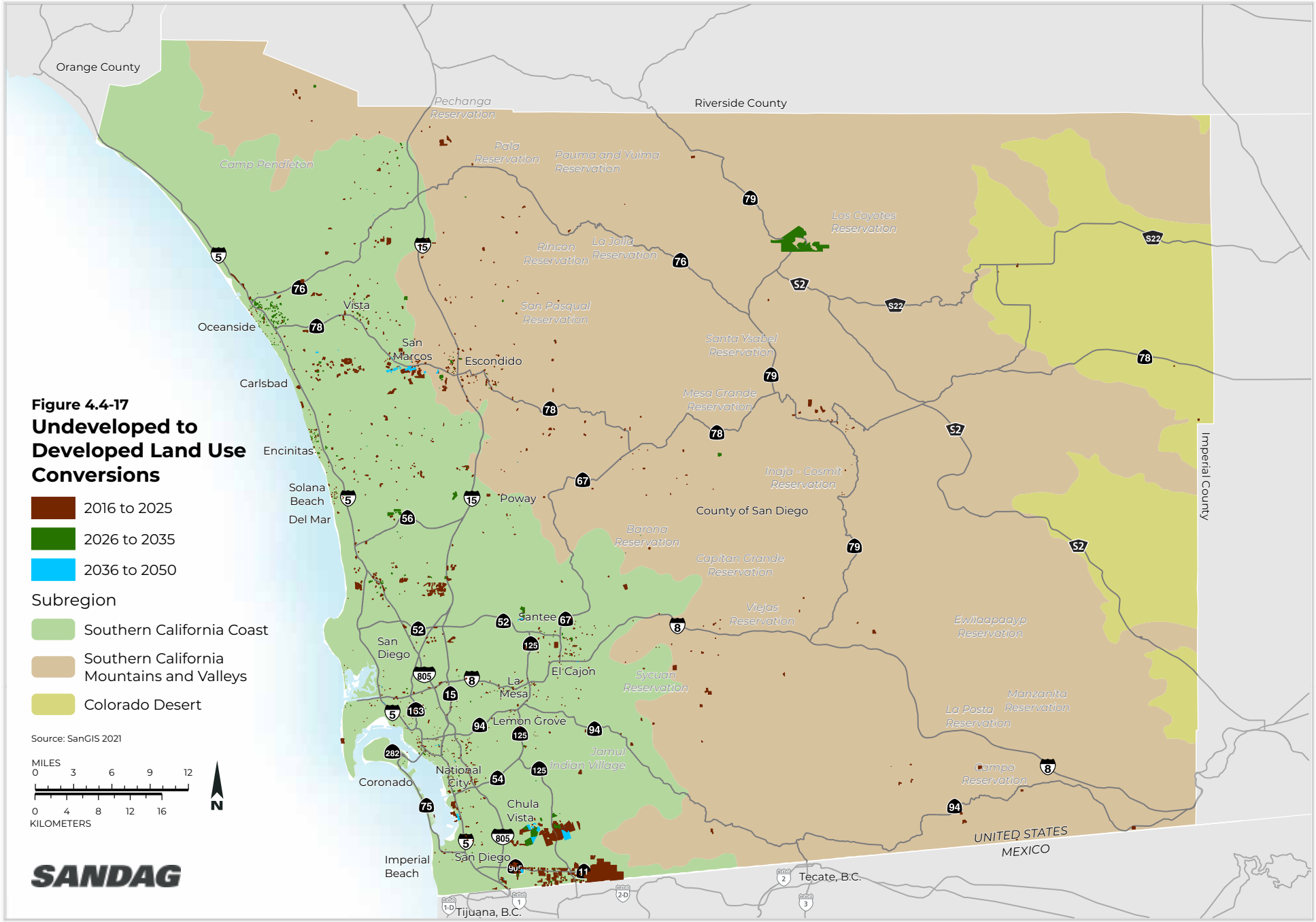
Vegetation Community	Regional Growth and Land Use Change	Transportation Network Improvements	Total
Riparian, Wetlands, and Other Aquatic Resources			
Beach/Coastal Dunes/Saltpan/Mudflats*	10.8	--	10.8
Disturbed Wetland*	10.7	--	10.7
Marsh*	54.5	2.6	57.1
Meadows and Seeps*	0.8	--	0.8
Open Water and Streams*	37.6	1.1	38.7
Riparian Forest/Woodland*	46.5	4.1	50.6
Riparian Scrub*	47.0	1.6	48.6
Vernal Pools*	0.5	--	0.5
Riparian and Wetlands Total	**208.4**	**9.4**	**217.8**
			Uplands
Chaparral*	885.3	--	885.3
Coastal Sage Scrub*	1,895.0	5.0	1,900.0
Desert Dunes	0.3	--	0.3
Desert Scrub	19.4	--	19.4
Oak Woodlands*	115.6	2.0	117.6
Forest/Woodland	154.6	2.3	156.9
Grasslands*	2,176.4	23.8	2,200.2
Uplands Total	**5,246.6**	**33.1**	**5,279.7**
Grand Total	**5,455.0**	**42.5**	**5,497.5**

~~* Indicates vegetation community aggregations that include impacts on sensitive vegetation communities or potentially regulated aquatic resources, and that may require mitigation.~~

The three riparian and wetland vegetation communities with the largest impact acreage as a result of land use change between 2016 and 2025 include marsh (the majority of which, 41.3 acres, occurs to coastal salt marshes), riparian scrub, and riparian forest/woodland (Table 4.4-7). The upland vegetation communities with the greatest amount of impacts are grasslands and coastal sage scrub, followed by chaparral (Table 4.4-7). The impacts on forests and woodlands identified in Table 4.4-7 are limited to eucalyptus woodlands, which are not considered sensitive vegetation communities themselves, but impacts on these resources may affect nesting raptors and other migratory birds and would require mitigation under the Migratory Bird Treaty Act. Appendix E-1 lists the detailed classifications of the 2021~~17~~ vegetation data that were organized into aggregated vegetation groups. Between 2016 and 2025, regional growth and land use change is primarily focused in existing urban areas and currently undeveloped areas adjacent to the existing urbanized area in the western third of the County (Figure 4.4-17). Therefore, coastal and shrubland vegetation communities bear the majority of projected impacts. These habitats are generally limited in distribution and unique to the San Diego region,

and therefore are important for the survival of many special-status plant and animal species. Specifically, coastal sage scrub, one of the most sensitive vegetation communities in the County, receives the second highest impact quantities (after grasslands).

Much of the forecasted growth will be focused around the proposed Mobility Hubs. The highest percentage of regional population increase between 2016 and 2025 is in the City of San Diego (58 percent), and of this, the densest growth in the 2025 horizon year will occur in the Otay Mesa area with commercial and industrial development. The next tier of regional growth in the 2025 horizon year will occur in the City of Chula Vista (12 percent), specifically at Otay Ranch and the San Diego Bay, and the City of Escondido (9 percent). Additional significant growth is expected in the communities of National City, La Mesa, and San Marcos. Most of these cities are relatively built-out, and growth would occur mainly through infill development. Consequently, locations projected to experience the most extensive loss of sensitive vegetation communities between 2016 and 2025 would include areas of significant open space, such as the Otay community planning area; areas between I-805 and SR 125 in the cities of National City and Chula Vista; areas surrounding the cities of Santee (i.e., Fanita Ranch), Lakeside, and El Cajon; areas north and south of the SR 56 corridor in the San Diego planning areas of Mira Mesa and Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, Torrey Highlands, and Rancho Peñasquitos; areas between the City of Oceanside and Vista north and south of SR 76 and SR 78; the areas between San Marcos and Escondido; and the unincorporated County in the North County Metro and Warner Springs areas. Small developments are forecasted for the communities of Pauma Valley, Valley Center, Julian, Ramona, Descanso, Crest, Boulevard, and Potrero; in addition to unincorporated areas southeast of Rancho San Diego and east of Jamul. Furthermore, the University of California San Diego and California State University San Marcos are planning campus improvements and additional development by the 2025 horizon year that may affect sensitive vegetation.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.
Figure 4.4-17
Undeveloped to Developed Land Use Conversions
2016 to 2025
2026 to 2035
2036 to 2050
Subregion
Southern California Coast
Southern California Mountains and Valleys
Colorado Desert
Source: SanGIS 2021
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Indirect Impacts

Indirect impacts may occur on sensitive vegetation communities and regulated aquatic resources in proximity to areas converted from undeveloped to developed land uses from regional growth and land use change. Changes in hydrology, runoff, sedimentation, fugitive dust, and edge effects (e.g., exotic plant invasion, parasites, disturbance from human activities, pesticides, fuel modification) can degrade vegetation communities. Additional impervious surface area would increase stormwater runoff, peak discharges, and flood magnitude downstream. Such hydrological changes can cause stream and bank erosion, and change the type and extent of habitats that occur along the stream corridor.

Alteration of the natural fire regime could lead to an elimination of fire in small habitat fragments adjacent to development or to an increase in fire frequency and/or intensity from anthropogenic ignition. These alterations can lead to type conversion (replacement of one habitat with another). Type conversion is a complex issue with many variables, but in most cases when it occurs, the conversion is from a higher quality native habitat (e.g., coastal sage scrub) to a lower quality habitat or nonnative community (e.g., nonnative grassland), thereby potentially and drastically reducing habitats for sensitive species such as the California coastal gnatcatcher, which is directly associated with coastal sage scrub habitat. These indirect impacts are also described as they pertain to special-status species under Impact BIO-2 below. In addition to habitat conversions, increased fire frequency and temperature could also permanently affect the ability of vegetation communities and associated soils to store carbon and to provide climate change resiliency.

Summary

As discussed in Section 4.4.2, numerous federal, state, and local laws, regulations, and programs are in place to protect biological and aquatic resources. Due to CFGC Section 1600 et seq., Section 404 of the federal CWA, and CCA regulation of State waters up to the mean high tide line, permanent wetland impacts would likely be minimal. Additionally, local ordinances, plans, and habitat mitigation requirements (e.g., RPO, HLP Ordinance, ESL regulations, tree protection ordinances, etc.) would reduce impacts on sensitive vegetation communities. Regional NCCPs and HCPs that have been adopted with the goal of creating development patterns address the impacts of urban growth and natural habitat loss in order to preserve sensitive vegetation communities at the ecosystem level to maintain biological integrity and connectivity while accommodating compatible land use. While adherence to the existing laws, regulations, and programs discussed above would reduce impacts on biological resources from implementation of the proposed Plan, it cannot be concluded that adherence would ensure impacts would be less than significant for all projects.

Considering both direct and indirect impacts, ground-disturbing activities related to land use change associated with the proposed Plan would result in a substantial adverse change to sensitive natural communities and regulated aquatic resources. This would be a significant impact.

Transportation Network Improvements and Programs

Direct Impacts

Transportation network improvements are developed to accommodate the projected growth and increases in population, housing, and employment from the implementation of the 5 Big Moves. A summary of key transportation network improvements is provided in Chapter 2, Section 2.5, *Project Characteristics*. Transportation network improvements are primarily focused within and adjacent to existing urbanized areas in the western one-third of the San Diego region. The rural eastern region of San Diego County would

experience rural corridor improvements. Transportation network improvement locations are illustrated on Figures 2-1 through 2-21 in Chapter 2, *Project Description*.

The nature of direct impacts would be the same as those described above for regional growth and land use change. Although many of the proposed transportation improvements would occur within already established transportation corridors, many of the components of the new integrated transportation system, specifically the construction of Complete Corridors, the new transit network, and Mobility Hubs will require significant ground-disturbance; specifically, the construction of Mobility Hubs; additional managed lanes; additional transit tracks associated with the Trolley, LOSSAN, or SPRINTER; regional arterial improvements; and new bikeways. These ground-disturbing activities would include vegetation removal, brush clearing, grading, trenching, excavation, and/or soil removal of any kind associated with transportation extensions and expansions, and would impact regulated aquatic resources and sensitive vegetation communities. The types and nature of direct and indirect impacts that may occur on regulated waters and vegetation communities are discussed above.

Estimated direct impacts that would occur on vegetation communities as a result of transportation network improvements between 2016 and 2025 are provided in Table 4.4-7. The riparian and wetland vegetation communities with the greatest amount of impacts as a result of transportation network improvements are riparian forest and marsh, specifically southern coastal salt marsh (1.6 acres), which is an extremely sensitive vegetation community in the context of providing climate change resiliency, followed by riparian scrub (Table 4.4-7). The upland vegetation communities with the greatest amount of impacts are grasslands, followed by coastal scrub (Table 4.4-7). Most transportation network improvements in the 2025 horizon year are focused on local street improvements and bikeways, and most have direct impacts on sensitive vegetation of approximately 5 acres or less. These include arterial road improvements and/or extensions in the City of Carlsbad (including College Boulevard and El Camino Real over Batiquitos Lagoon, across Escondido Creek at Via de la Valle in the City of San Diego; and the widening of La Media Road south of SR 905 along habitats protected by the VPHCP. ~~One of the larger impacts on sensitive vegetation from transportation network projects in the 2025 horizon year is from the construction of the new four-lane toll road SR 11/Otay Mesa East Port of Entry (POE) from SR 125 to Mexico.~~

Indirect Impacts

The type and nature of indirect impacts would be the same as those described above for regional growth and land use change.

Summary

By 2025, implementation of the transportation network improvements included as part of the proposed Plan would impact both regulated aquatic resources, including wetlands, and sensitive vegetation communities, specifically coastal sage scrub. Adherence to existing federal, state, and local laws, regulations, and programs would help reduce impacts but would not ensure impacts would be less than significant.

Considering both direct and indirect impacts, ground-disturbing activities related to transportation network improvements proposed by the proposed Plan would result in a substantial adverse change to sensitive natural communities and regulated aquatic resources. This would be a significant impact.

2025 Conclusion

Implementation of regional growth and land uses changes and transportation network improvements between 2016 and 2025 would result in substantial adverse effects on sensitive natural communities and regulated aquatic resources. While adherence to the existing laws, regulations, and programs discussed above would reduce impacts on biological resources from implementation of the proposed Plan, it cannot be concluded that adherence would ensure impacts would be less than significant for all projects. Considering both direct and indirect impacts, ground-disturbing activities related to land use change associated with the proposed Plan would result in a substantial adverse change to sensitive natural communities and regulated aquatic resources. Therefore, this impact (BIO-1) in the year 2025 would be significant.

2035

Regional Growth and Land Use Change

Direct Impacts

The type and nature of direct impacts on regional growth and land uses changes would be same as described above for the 2025 horizon year. Estimated direct impacts on vegetation communities and regulated aquatic resources for the 2035 horizon year are provided in Table 4.4-8. Tables E-6-1 through E-6-3 in Appendix E-6 summarizes the project-by-project impacts on vegetation communities for each horizon year.

Table 4.4-8
Estimated Direct Impacts on Sensitive Vegetation Communities and Regulated Aquatic Resources Within the San Diego Region (acres) up to Year 2035

Vegetation Community	Regional Growth and Land Use Change	Transportation Network Improvements	Total
Riparian and Wetlands			
Beach/Coastal Dunes/Saltpan/Mudflats*	10.8	--	10.8
Disturbed Wetland*	10.7	--	10.7
Marsh*	55.7	1.5	57.2
Meadows and Seeps*	0.8	--	0.8
Open Water and Streams*	42.1	1.5	43.6
Riparian Forest/Woodland*	64.1	11.3	75.4
Riparian Scrub*	64.6	8.6	73.2
Vernal Pools*	0.2	--	0.2
Riparian and Wetlands Total	**249.0**	**22.9**	**271.9**
			Uplands
Chaparral*	1,556.9	12.7	1,569.6
Coastal Sage Scrub*	2,086.1	45.3	2,131.4
Desert Dunes	0.3	--	0.3
Desert Scrub	52.4	--	52.4
Oak Woodlands*	223.0	0.1	223.1

Vegetation Community	Regional Growth and Land Use Change	Transportation Network Improvements	Total
Forest/Woodland	157.1	0.7	157.8
Grasslands*	2,754.3	35.8	2790.1
Uplands Total	**6,830.1**	**94.6**	**6,924.7**
Grand Total	**7,196.6**	**117.5**	**7,314.1**

~~* Indicates vegetation community aggregations that include impacts to sensitive vegetation communities or potentially regulated aquatic resources, and that may require mitigation.~~

The riparian and wetland vegetation communities with the largest impact acreage as a result of land use change through 2035 are riparian forest/woodland and riparian scrub, followed by marsh (including coastal salt marshes with 41.7 acres) and open water and streams (Table 4.4-8). The upland vegetation communities with the greatest amount of impacts are grasslands and coastal sage scrub (Table 4.4-8) in the same order as impacted for the 2025 horizon year, except the impacts are higher than in 2025.

Between 2026 and 2035, regional growth and land use change is concentrated in a manner similar to that noted for the 2025 horizon year; however, more intense growth is centered around the corridor between National City and El Cajon south of SR 94, and around Warner Springs/SR 79. Much like in 2025, regional growth and land use change is primarily focused in existing urban areas and currently undeveloped areas adjacent to the existing urbanized area in the western third of the County, except for Otay Mesa, which will continue to encroach into currently undeveloped land (Figure 4.4-17). Impacts on riparian communities are higher than in 2025, and coastal and shrubland vegetation communities again bear the majority of projected impacts. These habitats are generally limited in distribution and unique to the San Diego region, and therefore are important for the survival of many special-status plant and animal species. Similar to the 2025 horizon year, coastal sage scrub, one of the most sensitive vegetation communities in the County, receives the second highest impact quantities (after grasslands).

Indirect Impacts

The type and nature of indirect impacts would be similar to those described above for 2025.

Summary

As discussed for 2025, while adherence to the existing laws, regulations, and programs detailed in Section 4.4.2 would reduce impacts of the proposed Plan on biological resources, it cannot be concluded that adherence would ensure impacts would be less than significant for all projects.

Considering both direct and indirect impacts, ground-disturbing activities related to land use change under the proposed Plan would result in substantial adverse change to sensitive natural communities and regulated aquatic resources. This would be a significant impact.

Transportation Network Improvements and Programs

Direct Impacts

Similar to 2025, transportation network improvements are primarily focused within and adjacent to existing urbanized areas in the western one-third of the San Diego Region, but new ground-disturbing activities would impact sensitive vegetation communities and regulated waters, including wetlands. Estimated direct impacts

on vegetation communities due to transportation network improvements between 2026 and 2035 are provided in Table 4.4-8. The riparian and wetland vegetation communities with the greatest amount of impacts as a result of transportation network improvements are riparian forest/woodland and riparian scrub (Table 4.4-8). The upland vegetation communities with the greatest amount of impacts as a result of transportation network improvements are coastal scrub and grasslands (Table 4.4-8).

Between 2026 and 2035, many improvement projects are not expected to result in greater than a 5-acre loss of sensitive vegetation communities. However, those that are expected to exceed 5 acres of impacts include two new managed lanes along SR 78 from I-5 to Twin Oaks Valley Road, specifically between El Camino Real and College Boulevard; I-805 to SR 56 along Los Penasquitos Lagoon; I-805 from SR 52 to Carroll Canyon Road; SR 52 from SR 163 to SR 125, specifically through undeveloped portions of the Marine Corps Air Station Miramar; I-15 from SR 163 to Miramar; I-5 widening along Rose Canyon; and I-5 widening in the South Bay across Otay Valley and the South Bay salt ponds and estuaries.

Rail improvements that could potentially significantly impact sensitive vegetation include the SPRINTER double-tracking from Oceanside to Escondido; and LOSSAN double-tracking and associated improvements from Del Mar to Sorrento Valley along Los Penasquitos Lagoon. Tables E-6-1 through E-6-3 in Appendix E-6 summarizes the project-by-project impacts on sensitive vegetation communities for transportation network improvements for each horizon year.

Indirect Impacts

The type and nature of indirect impacts would be similar to those described above for 2025.

Summary

By 2035, implementation of the transportation network improvements included as part of the proposed Plan would impact both regulated aquatic resources, including wetlands, and sensitive vegetation communities, specifically coastal sage scrub. As discussed for the 2025 horizon year, adherence to existing federal, state, and local laws, regulations, and programs would help reduce impacts but would not ensure impacts would be less than significant.

Considering both direct and indirect impacts, ground-disturbing activities related to transportation network improvements proposed by the proposed Plan would result in a substantial adverse change to sensitive natural communities and regulated aquatic resources. This would be a significant impact.

2035 Conclusion

Implementation of the regional growth and land uses changes and the transportation network improvements for between 2026 and 2035 would result in substantial adverse effects on sensitive natural communities and regulated aquatic resources. These impacts (BIO-1) would be significant.

2050

Regional Growth and Land Use Change

Direct Impacts

The type and nature of direct impacts on regional growth and land uses changes would be same as described above for the 2035 horizon year. Estimated direct impacts on vegetation communities and regulated aquatic resources are provided in Table 4.4-9 for the 2050 horizon year. Tables E-6-1 through E-6-3 in Appendix E-6 summarizes the project-by-project impacts on vegetation communities for each horizon year.

Table 4.4-9
Estimated Direct Impacts on Sensitive Vegetation Communities and Regulated Aquatic Resources Within the San Diego Region (acres) up to Year 2050

Vegetation Community	Regional Growth and Land Use Change	Transportation Network Improvements	Total
Riparian and Wetlands			
Beach/Coastal Dunes/Saltpan/Mudflats*	10.9	--	10.9
Disturbed Wetland*	10.7	--	10.7
Marsh*	50.1	12.10	72.12
Meadows and Seeps*	0.8	--	0.8
-Open Water and Streams*	42.1	7.02	49.13
Riparian Forest/Woodland*	68.1	11.6	79.7
Riparian Scrub*	64.5	13.67	78.12
Vernal Pools*	0.1	0.2	0.317
Riparian and Wetlands Total	**247.3**	**44.4**	**302921.17**
			Uplands
Chaparral*	1,565.2	12.1	1,577.3
Coastal Sage Scrub*	2,165.4	75.08	2,240241.42
Desert Dunes	0.3	--	0.3
Desert Scrub	52.4	--	52.4
Oak Woodlands*	224.0	0.1	224.1
Forest/Woodland	159.6	1.1	160.7
Grasslands*	2,958.4	150.0	3,108.4
Uplands Total	**7,125.3**	**238.3**	**7,363364.64**
Grand Total	**7,372.6**	**282.7**	**7,655666.53**

* Indicates vegetation community aggregations that include impacts to sensitive vegetation communities or potentially regulated aquatic resources, and that may require mitigation.

The three riparian and wetland vegetation communities with the largest impact acreage as a result of land use change through 2050 are riparian forest/woodland, riparian scrub, and marsh (including coastal salt marshes with 35.9 acres of impact); waters and streams would also be significantly impacted (Table 4.4-9). The three upland vegetation communities with the greatest amount of impacts are grasslands, coastal sage scrub, and

chaparral (Table 4.4-9) in the same order as impacted for the 2025 and 2035 horizon years, except the impacts are higher than in either of those years. In total, by 2050 the region will have lost approximately 1 percent of all sensitive upland scrub habitats.

By 2050, regional growth and land use change is primarily focused in existing urban areas and currently undeveloped areas adjacent to the existing urbanized area in the western third of the County (Figure 4.4-17), with the highest concentrations in the same areas as seen for 2035. Coastal and shrubland vegetation communities again bear the majority of the projected impacts. These habitats are generally limited in distribution and unique to the San Diego region, and therefore are important for the survival of many special-status plant and animal species. Again, coastal sage scrub, one of the most sensitive vegetation communities in the region, receives the second highest impact quantities (after grasslands).

Indirect Impacts

The type and nature of indirect impacts would be similar to those described above for 2025 and 2035.

Summary

As discussed for 2025 and 2035, while adherence to the existing laws, regulations, and programs detailed in Section 4.4.2 would reduce impacts of the proposed Plan on biological resources, it cannot be concluded that adherence would ensure impacts would be less than significant for all projects.

Considering both direct and indirect impacts, ground-disturbing activities related to land use change under the proposed Plan would result in substantial adverse change to sensitive natural communities and regulated aquatic resources. This would be a significant impact.

Transportation Network Improvements and Programs

Direct Impacts

Similar to 2025 and 2035, transportation network improvements are primarily focused within and adjacent to existing urbanized areas in the western one-third of the San Diego Region for the 2050 horizon year (see Figures 2-1 through 2-21); however, new ground-disturbing activities would impact sensitive vegetation communities and regulated aquatic resources. The types and nature of the direct impacts are similar to the 2025 and 2035 analysis. Estimated direct impacts that would occur on vegetation communities as a result of transportation network improvements up to the 2050 horizon year are provided in Table 4.4-9. The three riparian and wetland vegetation communities with the greatest amount of impacts as a result of transportation network improvements are riparian scrub, marsh (including coastal salt marsh of 11.4 acres of impact), and riparian forest/woodland (Table 4.4-9). The upland vegetation communities with the greatest amount of impacts are grasslands and coastal scrub (Table 4.4-9).

For the 2050 horizon year, impacts to sensitive vegetation communities would occur from the following road improvements: SR 125 to SR 52 along Mission Trails Park; SR 54 to SR 125, and SR 125 along Sweetwater Reservoir; I-805 across Otay River Valley; SR 125 across Otay River Valley and in undeveloped portions of the Otay Mesa; and SR 905 between I-805 and the international border along undeveloped sensitive habitats. The most significant impacts on sensitive vegetation by the 2050 horizon year would occur from the Complete Corridor and widening of I-5 across several lagoons, including from Manchester Avenue to SR 78; two new general purpose lanes on SR 76 and North River Road to I-15 through the San Luis Rey River Valley; and the Complete Corridor development of I-15 north of SR 76 through undeveloped lands and important wildlife

movement corridors. Minor impacts would occur from construction of the North Coast Bike Trail: Gilman Drive to San Luis Rey River Trail (remaining segments) and AT152 the Chollas Creek Bikeways: North Fork – Bayshore Bikeway to University Bikeway and South Fork – Petway Park to Market Creek Plaza.

Indirect Impacts

The type and nature of indirect impacts would be similar to those described above for 2025 and 2035.

Summary

By 2050, transportation network improvements included as part of the proposed Plan would impact both regulated aquatic resources and sensitive vegetation communities. As discussed under regional growth and land use change for 2050, adherence to existing federal, state, and local laws, regulations, and programs discussed in Section 4.4.2 would help reduce impacts but would not ensure impacts would be less than significant.

Considering both direct and indirect impacts, ground-disturbing activities related to transportation network improvements under the proposed Plan would result in substantial adverse change to sensitive natural communities and regulated aquatic resources. This would be a significant impact.

2050 Conclusion

Implementation of the regional growth and land uses changes and the transportation network improvements for the 2050 horizon year would result in substantial adverse effects on sensitive natural communities and regulated aquatic resources. These impacts (BIO-1) would be significant.

Exacerbation of Climate Change Effects

The proposed Plan could exacerbate climate change effects on sensitive natural communities or regulated waters and wetlands. The vegetation communities most affected by regional growth and land use change include riparian forest/woodland, riparian scrub, marsh, waters and streams, grasslands, coastal sage scrub, and chaparral. Climate change is also expected to have an impact on these vegetation communities:

- High temperatures and extended periods of drought could affect forests, and warmer winter temperatures may promote survival and reproduction of pests that can cause damage to trees (Messner et al. 2011)
- Coastal sage scrub in Southern California is moderately vulnerable to climate change due to its sensitivity to climate stressors; increased wildfire frequency and intensity could shift scrublands to nonnative grasslands (EcoAdapt 2017).
- Sea-level rise could increase saltwater intrusion into freshwater ecosystems and higher temperatures could cause thermal stress in streams (ICLEI 2012, Jennings et al. 2018). More frequent and intense drought conditions may also change stream levels and damage riparian habitats (Hillberg et al. 2017, Jennings et al. 2018). Sea-level rise could also result in coastal flooding and inundate coastal wetlands (Heberger et al. 2009).
- For all vegetation communities, higher temperatures and shifting rainfall patterns could affect plant germination and habitat composition, which in turn may also impact soil carbon sequestration levels and rates (EcoAdapt 2017, Bradford et al. 2016, Ren et al. 2020).

Development could worsen these effects; some human activities could also worsen specific climate change risks, such as wildfire, due to the higher risk of human ignition from population and housing growth. Thus, development from the proposed Plan can exacerbate climate change effects on sensitive natural communities and regulated waters and wetlands.

MITIGATION MEASURES

BIO-1 HAVE A SUBSTANTIAL ADVERSE EFFECT ON ANY RIPARIAN HABITAT OR OTHER SENSITIVE NATURAL COMMUNITIES IDENTIFIED IN LOCAL OR REGIONAL PLANS, POLICIES, REGULATIONS, OR BY CDFW OR USFWS; OR HAVE A SUBSTANTIAL ADVERSE EFFECT ON STATE OR FEDERALLY REGULATED WATERS AND WETLANDS THROUGH DIRECT REMOVAL, FILLING, HYDROLOGICAL INTERRUPTION, OR OTHER MEANS

2025, 2035, and 2050

BIO-1a Implement Design, Minimization, and Avoidance Measures for Sensitive Natural Vegetation Communities and Regulated Aquatic Resources. During project planning, design, project-level CEQA review, and construction of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, avoid impacts on sensitive natural communities and regulated aquatic resources when feasible. Avoidance measures include, but are not limited to, the following:

- Conduct early coordination with the Wildlife Agencies and the respective local jurisdictions to design alignments that avoid sensitive resources and preserved lands.
- During the site identification and project design process, to the extent feasible, prioritize the least environmentally constrained site, and select a design that avoids and minimizes impacts on biological resources and NCCP lands, and maintains habitat integrity.
- Confine development footprints to the minimum amount of undeveloped area necessary for construction and safe, reliable operation. Limit access routes and staging areas to existing roadways, and developed or disturbed areas. Direct drainages away from sensitive habitats, such as canyons. Clearly delineate all construction areas, staging areas, and access routes in the final engineering plans.
- Limit grading and earth-moving activities to the permitted impact footprint. Install environmentally sensitive area fencing or flagging along the limits of disturbance prior to the start of construction to avoid incidental loss of sensitive habitat types.
- Require biological monitoring and regular inspections for construction in the vicinity of and adjacent to sensitive habitats to avoid impacts on these habitats. Report any special-status species and natural communities detected during project surveys to the CNDDB.

BIO-1b Provide Compensatory Mitigation. Where impacts are unavoidable, during project planning, design and project-level CEQA review of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, provide compensatory mitigation, as specified by and consistent with ~~approved~~adopted MSCP or MHCP guidelines and agreements, applicable federal and State regulatory requirements for mitigating impacts on regulated aquatic resources, applicable local regulations protecting sensitive natural communities, or through consultation with resource agencies. SANDAG shall, and other implementing agencies can and should, establish appropriate mitigation ratios where ratios have not already been established through ordinances and guidelines, specifically for impacts on sensitive coastal, riparian, and shrubland communities.

SANDAG shall, and other implementing agencies can and should, design compensatory mitigation to result in the conservation, establishment, or creation of self-sustaining sensitive natural and native communities, replacing the lost habitat and/or habitat value as required to offset those lost from project implementation. ~~Mitigation through officially approved and established mitigation banks should be prioritized as feasible.~~ Otherwise, mitigation measures would include the requirement for and financing of long-term conservation and management requirements of the mitigation projects.

Sensitive Vegetation Communities

For impacts outside the Coastal Zone, provide compensatory mitigation in the form of project- and habitat-specific onsite or offsite mitigation. Offsite mitigation would occur through several options, including (1) the purchase of credits at an existing authorized mitigation bank within or adjacent to the ecoregion or watershed within which the impacts occurred; (2) in lieu fee program; or (3) project-specific (permittee responsible) mitigation, such as habitat enhancement, establishment (creation), or re-establishment (restoration). Mitigation should occur as close to the impact and in the same local watershed as feasible, unless compelling ecological benefits, as supported by the State and federal wildlife agencies, would result from mitigation located in another area.

Compensatory mitigation for impacts inside the North Coast Public Works Plan/Transportation and Resource Enhancement Program (PWP/TREP 2014) should be consistent with Chapter 6B Resources Enhancement and Mitigation Program. Compensatory mitigation for impacts inside the Coastal Zone and outside the PWP/TREP should be provided within the Coastal Zone as close as feasible to the impact. Consistent with the resource agencies approval and applicable adopted plans, ordinances, and policies, provide compensatory mitigation for sensitive upland vegetation communities through the following:

- Onsite restoration and post-restoration monitoring for temporary impacts using appropriate native species and natural habitat configurations similar to or better than those impacted.
- On- or offsite preservation of existing habitats through acquisition and/or restoration using EMP and other (e.g., project-specific) mitigation funds for permanent impacts. Protect mitigation lands in perpetuity (e.g., through a conservation easement or similar legal conservation assurance to be approved by the regulatory agencies), fund long-term management (e.g., through the establishment of an endowment for habitat management and for easement management), and adequately manage such lands to maintain the originally intended biological quality and function in perpetuity.
- Offsite mitigation requirements met through EMP and/or other (e.g., project specific) mitigation funds. When mitigation is provided outside of an adopted NCCP/HCP plan area the following conditions should apply:
    - Give priority to mitigation lands connected to existing conserved open space.
    - Consider contributing to the establishment of large blocks of habitat or lands that are otherwise critical for covered species and/or providing for biological core areas and habitat linkages consistent with current regional conservation planning goals.
    - Mitigate impacts on critical habitat within the same Critical Habitat Unit where the impacts occurred.
- Purchase of habitat credits at an approved mitigation bank, or through payment into an in-lieu mitigation fee program applicable to the impacts and as approved by the Wildlife Agencies.

Regulated Aquatic Resources.

Construction within regulated aquatic resources would be subject to prior authorization by USACE, RWQCB, CDFW, and CCC (as applicable in the coastal zone). Consistent with the resource agencies' permitting and applicable adopted plans, ordinances, and policies, provide project-specific mitigation for impacts on regulated aquatic resources, including waters and wetlands, and associated state-regulated riparian habitat, through one of the following, in order of priority:

- Purchase of credits at an existing authorized mitigation bank or in lieu fee program, except within the coastal zone. Provide compensatory mitigation for impacts inside the coastal zone at sites within the coastal zone close to the impact. Mitigation of impacts on aquatic resources within the coastal zone may require offsets outside the coastal zone and would be negotiated with the CCC on a case-by-case basis.
- Project-specific (permittee responsible) mitigation. Apply an appropriate mitigation ratio for regulated aquatic resources in consultation with the regulatory agencies (i.e., following the USACE Standard Operating Procedure and any other applicable standards) to ensure no net loss of wetlands functions and services, account for temporal losses, and set in coordination with USACE, RWQCB and CDFW. Impacts on vernal pools within the City of San Diego would require mitigation consistent with the VPHCP (City of San Diego 2017); impacts on vernal pools outside the City of San Diego would require permitting through the RWQCB.

BIO-1c Prepare a Habitat Restoration Plan. During planning, design, and project-level CEQA review of transportation network improvements or development projects, and as part of the regulatory permitting process, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should—as specified through consultation with and as approved by the resource agencies, and consistent with ~~approved~~adopted MSCP or MHCP guidelines and agreements, and applicable federal and State regulatory requirements—prepare and implement a habitat restoration plan for impacts on sensitive natural communities or a Habitat Mitigation and Monitoring Plan (HMMP) consistent with the requirements of and approved by USACE, RWQCB, and CDFW for all impacts on regulated waters, including wetlands. This mitigation measure applies provided that mitigation does not occur through credit purchase at a mitigation bank. The restoration plan should include the following:

- Details regarding the location of the site, site conditions and functions, site preparation (e.g., grading, bio-engineering methods), recontouring, planting specifications (including native seed mixes and plant palettes), irrigation design (if determined necessary), and measures to control exotic vegetation.
- Details on avoidance of impacts on any extant sensitive biological resources that may occur as the result of habitat restoration, including direct loss and indirect effects related to changes in hydrology and associated potential effects on species composition.
- Identification of locally appropriate plant species for the plan, sourcing (e.g., seed collection, contract-growing of container plants), and outline of performance standards (success criteria). Success should be measured by comparing a similar, natural (undisturbed) reference site containing the same vegetation communities and located within the same watershed as the restoration site, and should use statistical metrics in consideration of the temporal difference between an established reference site and an immature restoration site.
- Performance standards sufficient to create self-sustaining habitat providing the functions and values required to offset those lost to the impacts and meet the requirements of applicable agency and adopted plans, ordinances, and policies. After final performance standards have been met and any relevant permitting agencies have approved the mitigation project as complete, the mitigation areas must be conserved and managed in perpetuity (see BIO-1d).

- Maintenance and monitoring procedures (including post-restoration monitoring and reporting). Any habitat restoration and mitigation site should be monitored for a minimum of 5 years or as required by regulatory agencies, but continue maintenance and monitoring until performance standards are met.
- Identification of remedial measures if the mitigation efforts fall short of the performance standards. Remedial measures typically include, but are not limited to, replanting, reseeding, topographical/surface contour adjustments, supplemental irrigation, access control, increased weed control, and extended maintenance and monitoring periods.
- Climate science and climate change resiliency and adaptation measures, to be developed as adaptive management strategies for restoration and long-term management planning to reflect the latest available information on climate change impacts and adaptation measures, such as seed storage and adaptation of the seed mixes and planting palettes to adapt to changing climate conditions and sea-level rise.

BIO-1d Prepare Habitat/Long-Term Management Plans. During project-level CEQA review of transportation network improvements or development projects and as part of the regulatory permitting process, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions should—as specified through consultation with and approved by the resource agencies, and consistent with ~~approved~~adopted MSCP or MHCP guidelines and agreements, and applicable federal and State regulatory requirements—prepare and implement a Long-Term Management Plan (LTMP) consistent with the requirements of USACE, RWQCB, and CDFW for all impacts on regulated waters, including wetlands; or a Habitat Management Plan (HMP) or Resources Management Plan (RMP) for upland mitigation areas. The management plans can and should be consistent with the SDMMP MSP (SDMMP 2017), be prepared by qualified and experienced ecologists to develop appropriate management and monitoring measures. ~~The management plans should outline~~describe management in perpetuity of the mitigation and conservation areas, ~~identify~~ illustrate adaptive management measures (Atkinson et al. 2004), outline management goals and objectives, and identify management tasks pursuant to these goals and objectives. Management goals should include adaptive management measures for climate adaptation and resiliency. Furthermore, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, prepare a management cost analysis to identify long-term management costs pursuant to measures outlined in the LTMP, HMP, or RMP. Long-term management should be funded using endowments or other financial assurances to generate sufficient annual interest to manage mitigation areas in perpetuity. In addition to the funding requirements, the management plans should also identify the habitat manager and propose a site protection instrument, such as an agency-approved Conservation Easement (CE), restrictive covenant or other title restriction that identifies the mitigation site to be conserved in perpetuity. In some cases, compensatory mitigation would occur through adding lands through public lands that are already preserved (e.g., National Wildlife Refuge).

BIO-1e Implement Best Management Practices to Avoid Indirect Impacts. During planning, design, project-level CEQA review, and construction of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, include location-specific measures to avoid and minimize construction-generated dust, erosion, runoff, and sedimentation, and exotic plant invasion, within or into sensitive natural habitats and jurisdictional waters. Location-specific measures include, but are not limited to, the following:

- Place construction materials, staging, storage, dispensing, fueling, and maintenance activities in upland areas outside of sensitive habitat, and take adequate measures to prevent any runoff from entering regulated waters, including wetlands.

- Fuel equipment on existing paved roads. Check contractor equipment for leaks prior to operation and repaired as necessary.
- Monitor construction activities using a qualified biologist when construction is occurring in, or adjacent to, sensitive natural communities and grant the biologist the authority to stop work if it deviates from approved plans and mitigation measures.
- Prohibit planting or seeding of invasive plant species that appear on the most recent version of the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory, including the development of an integrated invasive plant control plan describing protocols and enforcement schedules for maintenance, construction, and emergency activities working within and moving between important habitat areas.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of mitigation measures BIO-1a through BIO-1e would reduce or minimize this impact (BIO-1). However, while projects under SANDAG's control would adhere to these measures, there is no assurance that these mitigation measures would be implemented by non-SANDAG project sponsors or would be equally effective for all projects due to the wide variety of circumstances, such as lack of available mitigation sites, shortage of acreage at mitigation banks, mitigation complexity and cost, lack of long-term management and monitoring, and lack of enforcement. Instances may occur in which impacts are not reduced to less-than-significant levels. Therefore, this impact (BIO-1) would remain significant and unavoidable.

BIO-2 HAVE A SUBSTANTIAL ADVERSE EFFECT, EITHER DIRECTLY OR INDIRECTLY, ON ANY SPECIES IDENTIFIED AS A CANDIDATE, SENSITIVE, OR SPECIAL-STATUS SPECIES IN LOCAL OR REGIONAL PLANS, POLICIES, OR REGULATIONS, OR LISTED BY CDFW OR USFWS, INCLUDING THEIR FEDERALLY DESIGNATED CRITICAL HABITAT, OR SPECIES THAT ARE CONSIDERED SENSITIVE IN CEQA GUIDELINES SECTION 15380

ANALYSIS METHODOLOGY

Direct Impacts

As described in the above *Data Sources and Methods* subsections in Section 4.4.1, the identification of species locations requires direct field observations. In order to quantify impacts on special-status species populations, project-specific focused surveys would need to be conducted when project-level detail is available. This EIR's analysis considers impacts on non-listed special-status species based on a more general habitat level and qualitative analysis, including impacts on those regionally sensitive, but not listed, species, such as the southwestern pond turtle (*Actinemys pallida*), western burrowing owl, and coastal cactus wren (*Campylorhynchus brunneicapillus*), in addition to narrow endemic plant species and other NCCP-covered species. Direct impacts on the habitats of listed special-status plant and animal species (which for purposes of this EIR include species proposed for listing) and designated critical habitat are quantified using the GIS methods described under Impact BIO-1. Impacts identified for vegetation communities in the GIS analysis described under Impact BIO-1 are used to classify habitats and generally describe direct impacts that may occur on non-listed special-status species based on their habitat preferences. This method provides a conservative estimate of impacts on special-status species.

Temporary impacts were not analyzed using GIS methods as they are not known until project-specific plans have been prepared. It is assumed that all temporary impacts would be restored to or superior to preconstruction conditions

Regional Growth and Land Use Change

Special-status species impacts were evaluated using both GIS and qualitative methods. Typically, USFWS protocol surveys would be required to identify presence and quantify impacts for these species; however, these data are not practical or necessary on a programmatic level. In lieu of species- and site-specific information, analysis in this EIR conservatively assumes that special-status species are present within the areas that would be converted from undeveloped to developed land use (i.e., regional growth and land use change data) if there are mapped special-status species occurrences or suitable habitat present within these areas or within 500 feet thereof (taking into consideration any impacts on sensitive species from such sources as noise and lighting, as commonly required by the Wildlife Agencies and pursuant to local regulations and ordinances, such as the implementation documents for the local NCCPs).

Specifically, the GIS analysis used data on known occurrences of plant and animal species listed or proposed for listing (including candidate species) under FESA and CESA. GIS layers were developed to identify the extent of undeveloped areas that would be converted to developed land uses or rural residential land uses, and rural residential land uses that would be converted to developed land uses for each horizon year (see *Regional Growth and Land Use Change* under Impact BIO-1, *Analysis Methodology*). These layers were superimposed over known occurrences for special-status plant and animal species and USFWS-designated critical habitat layers developed from the dataset identified in Section 4.4.1.

The EIR analysis considers impacts on non-listed and non- proposed-for-listing special-status species based on a more general habitat level and qualitative analysis. Impacts on vegetation communities identified in the GIS analysis are used to generally identify direct impacts that may occur on non-listed special-status species that inhabit these vegetation communities. Impacts on non-listed special-status species that are covered by an NCCP typically require mitigation pursuant to and in accordance with the implementing entity's guidelines.

Transportation Network Improvements and Programs

Analysis in the EIR conservatively assumes that special-status species would be present within the transportation project footprint if there are known special-status species occurrences or suitable habitat is present within project footprints or within 500 feet thereof (understanding that special-status species may occur outside the 500-foot buffer). For each horizon year, species occurrences from three regional species occurrence databases—the CNDDB, the SanBIOS (County of San Diego 2021c) points and areas, and the USFWS Carlsbad Field Office sensitive species occurrences—were overlaid within 500 feet of the identified projects and tabulated. Special-status species impacts were evaluated using both GIS and qualitative methods described for the regional growth and land use change. GIS layers were developed for transportation project footprints (see *Transportation Network Improvements and Programs* under Impact BIO-1*, Analysis Methodology*) and analyzed as discussed for the regional growth and land use change methods.

Indirect Impacts

Indirect impacts that may occur on special-status species or their habitat (including critical habitat) in proximity to areas experiencing regional growth and land use change as well as transportation network improvements are qualitatively described on a broad scale.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Direct Impacts

Direct impacts are those resulting in direct losses of special-status animal and plant species. Specifically, direct impacts may include injury, death, and/or harassment, which ultimately would lead to the loss of the species or their ability to successfully reproduce. Direct impacts may also include the destruction of habitats necessary for species breeding, feeding, dispersal, or sheltering. Direct impacts on plants can include the direct removal of above- and below-ground portions of plants, or crushing of adult plants, bulbs, or seeds. These direct impacts would predominately occur during construction of developed land uses. Construction would require vegetation-clearing activities that would remove special-status species habitat. Construction may also result in impacts on special-status animal species from vehicle or construction equipment collisions.

After construction, operation and maintenance within urban development may result in impacts on special-status animal species from vehicular strikes with individuals crossing the roads. Vegetation management along urban areas may impact special-status species residing in those areas.

The total number of listed species occurrences (based on available occurrence data and species/suitable habitat models) impacted by regional growth and land use change by 2025 includes 11 listed plant species and 9 listed animal species. Tables E-7-1 and E-7-2 in Appendix E-7 provides a detailed list of listed plant and animal species that would be impacted by regional growth and land use change by 2025, respectively. Locations that would have the most impacts on listed species would coincide with the areas that would experience the most extensive loss of sensitive vegetation communities and regulated waters, including wetlands, by 2050, as described in Impact BIO-1, because these areas provide habitat for listed species.

Estimated direct impacts that would occur on critical habitat as a result of regional growth and land use change between 2016 and 2025 are provided in Table 4.4-10. Of species that have designated critical habitat, the largest impacts would occur on Otay tarplant (*Deinandra conjugens*), spreading navarretia (*Navarretia fossalis*), and thread-leaved brodiaea (*Brodiaea filifolia*). Impacts would also occur on San Diego thornmint (*Acanthomintha ilicifolia*) and Otay tarplant. Wildlife species affected include San Diego fairy shrimp (*Branchinecta sandiegonensis*), western snowy plover (*Charadrius nivosus*), California least tern (*Sternula antillarum browni*), light-footed Ridgway's rail (*Rallus obsoletus brevipes*), southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), Quino checkerspot butterfly, San Diego fairy shrimp, and coastal California gnatcatcher. The largest impacts would occur on Quino checkerspot butterfly and coastal California gnatcatcher (Table 4.4-10).

In addition to listed species, many non-listed special-status species would be impacted by regional growth and land use change because non-listed special-status species inhabit sensitive vegetation communities and regulated aquatic resources that would be impacted, as described in Impact BIO-1; many of these species are regulated through the local and regional NCCPs. In general, non-listed special-status species that would be most impacted are those that inhabit the vegetation communities most impacted. Because forecasted development is concentrated in the western third of the San Diego region, coastal and shrublands would bear the majority of projected impacts. Species with larger home ranges, such as raptors, bats, and large mammals, may be more susceptible to impacts from regional growth and land use changes that occur away from current urban areas

as opposed to regional growth and land use change that is concentrated around urban areas. Appendices E-2 and E-3 describe the vegetation communities where non-listed special-status species may occur.

Indirect Impacts

Indirect impacts would occur on special-status animal and/or plant species inhabiting habitat adjacent to areas converted from undeveloped to developed land uses under the proposed Plan's regional growth and land use change. Examples of indirect impacts on special-status species include the following:

- **Habitat Fragmentation:** Fragmented, smaller areas of habitat usually contain fewer species, have proportionally larger perimeters (making them more vulnerable to edge effects), are more likely to be biologically isolated from other habitat areas, and tend to be more vulnerable to adverse stochastic (i.e., random) events.
- **Changes in Hydrology**: Changes in hydrology, runoff, and sedimentation could indirectly affect surface water–dependent species. Increased runoff into native habitat and channelization for flood control could result in increased erosion and rates of scouring, which could result in downstream habitat loss for some species. Similarly, increased magnitude and frequency of high flows from urbanization could cause bank erosion and channel widening, and adversely affect species that rely on natural flow regimes for their persistence. Urban runoff can increase the temperature of adjacent streams due to higher water temperatures from streets, rooftops, and parking lots, and increases the variety and amount of pollutants carried into streams, rivers, and lakes. Perennial water sources may favor exotic species that can prey on and/or compete with native species.
- **Edge Effects:** The biological integrity of habitats adjoining development can be diminished by the effects of noise, lighting, exotic plant and animal invasion, dust/air pollution, predators, parasites, disturbance from human activities (i.e., increased mortality caused by encounters with humans or their pets), pesticides, fuel modification, and other factors:
    - **Predators**: Numerous predators such as snakes, opossums, raccoons, skunks, ground squirrels, and various corvids thrive on edges by making use of the additional food and water sources provided by residential development adjacent to open space habitat resulting in increased predation rates.
    - **Noise**: Higher ambient noise levels often result from development (construction and operation), which can adversely affect species that rely on sound to communicate (e.g., birds, frogs). The impact of noise on wildlife likely differs from species to species and is dependent on the source of the noise (e.g., aircraft versus blasting) and the decibel level, duration, and timing.
    - **Exotic Species**: Nonnative plant and animal species have few natural predators or other ecological controls on their population sizes, and they often thrive in disturbed habitats. Nonnative species may aggressively outcompete native species or otherwise harm special-status species; e.g., exotic plant species, such as giant reed, can rapidly invade native habitat areas and alter water flow and/or quantities as well as vegetation diversity and/or composition.
    - **Lighting**: Artificial night lighting could affect the habitat value for some species, particularly for nocturnal species, by modifying predation rates, obscuring lunar cycles, and/or causing direct habitat avoidance.
- **Fugitive Dust:** Construction-generated fugitive dust can adversely affect plants by reducing the rates of metabolic processes such as photosynthesis and respiration.

- **Alteration of Fire Regimes**: Alteration of the natural fire regime could lead to an elimination of fire in small habitat fragments adjacent to development or to an increase in fire frequency and/or intensity from anthropogenic ignition. These alterations can lead to the conversion of one habitat to another. Type conversion is a complex issue with many variables; however, in most cases when type conversion occurs, it results in the conversion of a higher quality native habitat (e.g., chaparral or coastal sage scrub) to a lower quality disturbed condition or nonnative community (e.g., nonnative grassland). Such conversion results in the loss of suitable habitat for species that rely upon the pre-fire native habitats for survival.

Permanent, indirect impacts would arise from increased human use of the area and unauthorized trespass, unauthorized trail use, presence of dogs and feral cats, trail-related erosion, direct mortality of species, increased nighttime lighting that may increase predation, increased noise associated with increased traffic volumes, and the increase in exotic species invasion. Permanent, indirect impacts on biological resources may also arise from the conversion of agricultural lands to urban land uses. Raptor species, in particular, often utilize agricultural land for foraging habitat. Orchards can provide nesting as well as foraging habitat for some species of songbirds. Many terrestrial species can utilize agricultural land that is adjacent to native habitat for supplemental forage or cover depending on the intensity and type of the agricultural activity present. Additionally, agricultural land situated between native habitat patches can provide movement corridors for terrestrial species.

Temporary, indirect impacts may arise from construction-related noise levels; construction-generated fugitive dust accumulation on surrounding vegetation; and construction-related erosion, runoff, and sedimentation into vegetation communities. Indirect impacts from these construction-related activities would be temporary, as these impacts would end with cessation of project construction.

Regional growth and land use change in each horizon year are primarily consolidated along existing urbanized areas and transportation corridors. Urban activity in these existing developed areas is currently indirectly impacting habitat adjacent to these areas. However, implementation of the proposed Plan would increase the intensity of indirect impacts by increasing activities that have indirect effects.

Summary

As discussed in Section 4.4.2, numerous federal, state, and local laws, regulations, and programs are in place to protect special-status species and their habitat. Federal laws and regulations including FESA, MBTA, and BGEPA protect federally listed species, migratory birds, and eagles, respectively. State laws and regulations, including CESA and CFGC, protect state-listed and sensitive species. Additionally, NCCP and HCP programs implemented in the San Diego region provide a process to strategically conserve special-status species within their respective plan areas.

By 2025, regional growth and land use change would result in development and redevelopment that would impact special-status species and their habitat. While adherence to the existing federal, state, and local laws, regulations, and programs discussed in Section 4.4.2 would reduce impacts on special-status species, it cannot be concluded that impacts would be less than significant for all projects. Considering both direct and indirect impacts, ground-disturbing activities related to land use change under the proposed Plan would result in substantial adverse change to species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS, and the habitat of these special-status species. This is a significant impact.

Table 4.4-10
Forecasted Direct Impacts on Areas Designated as Final Critical Habitat Within the San Diego Region (acres) up to the Year 2025

Common Name	Scientific Name	Regional Growth and Land Use Change	Transportation Network Improvements	Total
Plants				
San Diego thornmint	*Acanthomintha ilicifolia*	0.1	--	0.1
Thread-leaved brodiaea	*Brodiaea filifolia*	50.1	--	50.1
Otay tarplant	*Deinandra conjugens*	409.2	--	409.2
Spreading navarretia	*Navarretia fossalis*	52.8	--	52.8
Plants Total		**512.2**	**--**	**512.2**
Invertebrates				
Quino checkerspot butterfly	*Euphydryas editha quino*	1,022.6	--	1,022.6
Hermes copper butterfly	*Lycaena hermes*	24.5	--	24.5
San Diego fairy shrimp	*Branchinecta sandiegonensis*	306.1	3.3	309.4
Riverside fairy shrimp	*Streptocephalus woottonii*	1.6	--	1.6
Invertebrates Total		**1,354.8**	**3.3**	**1,358.1**
Reptiles and Amphibians				
Arroyo toad	*Anaxyrus californicus*	18.7	--	18.7
Reptiles and Amphibians Total		**18.7**	**--**	**18.7**
				Birds
Coastal California gnatcatcher	*Polioptila californica californica*	805.0	--	805.0
Least Bell's vireo	*Vireo bellii pusillus*	5.8	3.4	9.2
Birds Total		**810.8**	**3.4**	**814.2**
Grand Total		**2,696.5**	**6.7**	**2,703.2**

Transportation Network Improvements and Programs

Direct Impacts

Transportation network improvements would be the same as previously described in Impact BIO-1. The types and nature of direct impacts that may occur on special-status species are discussed above. Operation and maintenance of transportation network improvements may result in impacts on special-status animal species from vehicular strikes with individuals crossing the roads.

The total number of listed species occurrences impacted by all transportation network improvements in place by 2025 includes four listed plant species: the San Diego button-button celery (*Eryngium aristulatum*

parishii), Otay tarplant, Del Mar manzanita (*Arctostaphylos glandulosa* ssp*. crassifolia*) and San Diego ambrosia (*Ambrosia pumila*); and four listed animal species: the Quino checkerspot butterfly, San Diego fairy shrimp, least Bell's vireo, and California gnatcatcher. Tables E-7-1 and E-7-2 in Appendix E-7 summarizes the project-by-project impact on listed plant and animal species that would occur by 2025. Of species that have designated critical habitat, only two species' critical habitat is impacted as a result of transportation network improvements: San Diego fairy shrimp and least Bell's vireo (Table 4.4-10).

In addition to listed species, many non-listed special-status species would be impacted by regional growth and land use change because non-listed special-status species inhabit sensitive vegetation communities and regulated waters, including wetlands, that would be impacted, as described in Impact BIO-1. In general, non-listed special-status species that would be most impacted are those that inhabit the vegetation communities most impacted, including riparian forest/woodland, riparian scrub, open water, meadows and seeps, coastal sage scrub, chaparral, grasslands, and forest/woodland. Because transportation network improvements are concentrated near the coast, coastal species bear the majority of projected impacts. Appendices E-2 and E-3 describe the vegetation communities where non-listed special-status species may occur.

Indirect Impacts

The type and nature of indirect impacts would be the same as those described above for regional growth and land use change.

Summary

By 2025, the transportation network improvements projected in the proposed Plan would impact special-status species and their habitat. As discussed for the regional growth and land use change, adherence to the existing federal, state, and local laws, regulations, and programs discussed in Section 4.4.2 would reduce impacts on special-status species, it cannot, however, be concluded that impacts would be less than significant for all projects. Considering both direct and indirect impacts, ground-disturbing activities related to transportation network improvements under the proposed Plan would result in substantial adverse change to species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS, and the habitat of these species. This is a significant impact.

2025 Conclusion

Implementation of the regional growth and land use change as well as transportation improvements and programs would result in substantial adverse change to species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS, and the habitat of these special-status species. Therefore, this impact (BIO-2) in the year 2025 would be significant.

2035

Regional Growth and Land Use Change

Direct Impacts

Regional growth and land use change would be the same as previously described under the 2035 analysis for Impact BIO-1. The types and nature of the direct impacts that may occur on special-status species and their habitat are similar to 2025. The total number of listed species occurrences impacted by regional growth and land use change between 2026 and 2035 includes eight listed plant species and six listed wildlife species. Tables

E-7-3 and E-7-4 in Appendix E-7 provides a detailed list of listed plant and wildlife species that would be impacted by regional growth and land use change by 2035, respectively. Locations that would have the most impacts on listed species would coincide with the areas that would experience the most extensive loss of sensitive vegetation communities and regulated waters, including wetlands, by 2035, as described in Impact BIO-1, because these areas provide habitat for listed species.

Estimated direct impacts that would occur on critical habitat as a result of regional growth and land use change between 2026 and 2035 are provided in Table 4.4-11. Of species that have designated critical habitat, the species with the greatest acreage of impacts on critical habitat as a result of regional growth and land use change are Otay tarplant (plant species) and the following animal species: arroyo toad (*Anaxyrus californicus*), coastal California gnatcatcher, and Hermes copper butterfly (Table 4.4-11).

In addition to listed species, many non-listed special-status species and their habitat would be impacted by regional growth and land use change because non-listed special-status species inhabit sensitive vegetation communities and regulated waters, including wetlands, that would be impacted, as described in Impact BIO-1 In general, non-listed special-status species that would be most impacted are those that inhabit the vegetation communities most impacted, including riparian forest/woodland, riparian scrub, meadows and seeps, chaparral, grasslands, forest/woodland, and coastal scrub. Because forecasted development is concentrated in the western third of the San Diego region, coastal and shrublands would bear the majority of projected impacts. Species with larger home ranges, such as raptors, bats, and large mammals, may be more susceptible to impacts from regional growth and land use change that occurs away from current urban areas as opposed to regional growth and land use change that is concentrated around urban areas. Appendices E-2 and E-3 describe the vegetation communities where non-listed special-status species and their habitat may occur.

Indirect Impacts

The type and nature of indirect impacts would be similar to those described for 2025.

Table 4.4-11
Forecasted Direct Impacts on Areas Designated as Final Critical Habitat Within the San Diego Region (acres) Between 2026 and 2035

Common Name	Scientific Name	Regional Growth and Land Use Change	Transportation Network Improvements	Total
Plants				
San Diego thornmint	*Acanthomintha ilicifolia*	--	--	--
Thread-leaved brodiaea	*Brodiaea filifolia*	--	--	--
Otay tarplant	*Deinandra conjugens*	35.3	--	35.3
Spreading navarretia	*Navarretia fossalis*	--	--	--
Plants Total		**35.3**	**--**	**35.3**
				Invertebrates
Quino checkerspot butterfly	*Euphydryas editha quino*	--	--	--
Hermes copper butterfly	*Lycaena hermes*	58.1	34.4	92.5
San Diego fairy shrimp	*Branchinecta sandiegonensis*	0.4	7.4	7.8

Common Name	Scientific Name	Regional Growth and Land Use Change	Transportation Network Improvements	Total
Invertebrates Total		**58.5**	**41.8**	**100.3**
Fish				
Tidewater goby	*Eucyclogobius newberryi*	0.3	0.8	1.1
Fish Total		**0.3**	**0.8**	**1.1**
Reptiles and Amphibians				
Arroyo toad	*Anaxyrus californicus*	156.9	--	156.9
Reptiles and Amphibians Total		**156.9**	**--**	**156.9**
Birds				
California gnatcatcher	*Polioptila californica ~~californica~~*	49.0	9.6	58.6
Least Bell's vireo	*Vireo bellii pusillus*	29.6	22.1	51.7
Southwestern willow flycatcher	*Empidonax traillii extimus*	0.4	0.8	1.2
Birds Total		**79.0**	**32.5**	**111.5**
Grand Total		**330.1**	**76.2**	**406.3**

Summary

By 2035, regional growth and land use change would result in development and redevelopment that would impact special-status species and their habitat. As discussed for 2025, while adherence to the existing laws, regulations, and programs detailed in Section 4.4.2 would reduce impacts on special-status species and their habitat, it cannot be concluded that impacts would be less than significant for all projects. Considering both direct and indirect impacts, ground-disturbing activities related to land use change under the proposed Plan would result in a substantial adverse change to species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS. This is a significant impact.

Transportation Network Improvements and Programs

Direct Impacts

Transportation network improvements would be the same as previously described in the 2035 analysis for Impact BIO-1. The types and nature of direct and indirect impacts that may occur on special-status species and their habitat are similar to 2025. The total number of listed species occurrences impacted by all transportation network improvements in place between 2026 and 2035 includes eight listed plant species and eight listed wildlife species; many of these are species associated with vernal pools and riparian habitats. The 2035 horizon year includes the majority of Complete Corridor construction, including river and creek crossings that may result in impacts on least Bell's vireo, and impacts on undeveloped chaparral landscapes, which may affect Hermes copper butterfly (*Lycaena hermes*). Tables E-7-3 and E-7-4 in Appendix E-7 summarizes the project-by-project impact on listed plant and wildlife species that would occur by 2035.

Of species that have designated critical habitat, the three with the greatest acreage of impacts on critical habitat as a result of transportation network improvements are Hermes copper butterfly, least Bell's vireo, and coastal California gnatcatcher (Table 4.4-15).

In addition to listed species, many non-listed special-status species would be impacted by regional growth and land use change because non-listed special-status species inhabit sensitive vegetation communities and regulated waters, including wetlands, that would be impacted, as described in Impact BIO-1. In general, non-listed special-status species that would be most impacted are those that inhabit the vegetation communities most impacted, including riparian forest/woodland, riparian scrub, meadows and seeps, chaparral, grasslands, forest/woodland, and coastal scrub. Appendices E-2 and E-3 describe the vegetation communities where non-listed special-status species and their habitat may occur.

Indirect Impacts

The type and nature of indirect impacts would be the similar to those described for 2025.

Summary

By 2035, the transportation network improvements projected in the proposed Plan would impact special-status species. As discussed for 2025, while adherence to the existing laws, regulations, and programs detailed in Section 4.4.2 would reduce impacts on special-status species, it cannot be concluded that impacts would be less than significant for all projects. Considering both direct and indirect impacts, ground-disturbing activities related to transportation network improvements under the proposed Plan would result in a substantial adverse change to species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS, and the habitat of these species. This is a significant impact.

2035 Conclusion

Implementation of the regional growth and land use change as well as transportation improvements and programs would result in substantial adverse change to species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS, and the habitat of these special-status species. Therefore, this impact (BIO-2) in the year 2035 would be significant.

2050

Regional Growth and Land Use Change

Direct Impacts

Regional growth and land use change would be the same as previously described in the 2050 analysis under Impact BIO-1. The types and nature of the direct impacts that may occur on special-status species and their habitat are similar to 2025 and 2035. The total number of listed species occurrences impacted by regional growth and land use change between 2036 and 2050 includes four listed plant species and four listed wildlife species. Tables E-7-5 and E-7-6 in Appendix E-7 provides a detailed list of listed plant and animal species that would be impacted by regional growth and land use change by 2050.

Estimated direct impacts that would occur on critical habitat as a result of regional growth and land use change between 2036 and 2050 are provided in Table 4.4-12. Of species that have designated critical habitat, the three species with the greatest acreage of impacts on critical habitat as a result of regional growth and land use change are coastal California gnatcatcher, San Diego fairy shrimp, and arroyo toad; Otay tarplant also receives a large share of the impacts (Table 4.4-12).

Table 4.4-12
Forecasted Direct Impacts on Areas Designated as Final Critical Habitat Within the San Diego Region (acres) Between 2036 and 2050

Common Name	Scientific Name	Regional Growth and Land Use Change	Transportation Network Improvements	Total
Plants				
Otay tarplant	*Deinandra conjugens*	58.9	30.9	89.8
Spreading navarretia	*Navarretia fossalis*	7.8	--	7.8
Plants Total		**66.7**	**30.9**	**97.6**
Invertebrates				
Quino checkerspot butterfly	*Euphydryas editha quino*	--	10.4	10.4
San Diego fairy shrimp	*Branchinecta sandiegonensis*	5.1	98.9	104.0
Riverside fairy shrimp	*Streptocephalus woottonii*	5.2	3.7	8.9
Invertebrates Total		**10.3**	**113.0**	**123.3**
Fish				
Tidewater goby	*Eucyclogobius newberryi*	--	1.7	1.7
Fish Total		**--**	**1.7**	**1.7**
Reptiles and Amphibians				
Arroyo toad	*Anaxyrus californicus*	--	58.5	58.5
Reptiles and Amphibians Total		**--**	**58.5**	**58.5**
Birds				
California gnatcatcher	*Polioptila californica ~~californica~~*	--	36<u>74.4</u>~~9~~	36~~4.9~~<u>7.4</u>
Least Bell's vireo	*Vireo bellii pusillus*	--	43.7	43.7
Southwestern willow flycatcher	*Empidonax traillii extimus*	--	17.4	17.4
Birds Total		**--**	**32.5**	**~~111~~<u>114</u>.~~5~~<u>0</u>**
Grand Total		**330.1**	**630.0**	**962~~0.1~~<u>0</u>.~~6~~<u>16</u>**

In addition to listed species, many non-listed special-status species and their habitat would be impacted by regional growth and land use change because non-listed special-status species inhabit sensitive vegetation communities and regulated waters, including wetlands, that would be impacted, as described in Impact BIO-1. In general, non-listed special-status species that would be most impacted are those that inhabit the vegetation communities most impacted, including riparian forest/woodland, riparian scrub, meadows and seeps, chaparral, grasslands, forest/woodland, and coastal scrub. Because forecasted development is concentrated in the western third of the San Diego region, coastal and montane non-listed species would bear the majority of projected impacts. Species with larger home ranges, such as raptors, bats, and large mammals, may be more

susceptible to impacts from regional growth and land use change that occurs away from current urban areas as opposed to regional growth and land use change that is concentrated around urban areas. Appendices E-2 and E-3 describe the vegetation communities where non-listed special-status species and their habitat may occur.

Indirect Impacts

The type and nature of indirect impacts would be similar to those described for 2025 and 2035.

Summary

By 2050, regional growth and land use change would result in development and redevelopment that would impact special-status species and their habitat. As discussed for 2025 and 2035, while adherence to the existing laws, regulations, and programs detailed in Section 4.4.2 would reduce impacts on special-status species, it cannot be concluded that impacts would be less than significant for all projects. Considering both direct and indirect impacts, ground-disturbing activities related to land use change under the proposed Plan would result in a substantial adverse change to species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS, and habitat for these species. This is a significant impact.

Transportation Network Improvements and Programs

Direct Impacts

Transportation network improvements would be the same as previously described in 2050 analysis under Impact BIO-1. The nature and types of direct impacts that may occur on special-status species and their habitat are similar to 2025 and 2035. The total number of listed species occurrences impacted by all transportation network improvements in place between 2036 and 2050 includes ~~1~~ 8 listed plant species and 10 listed wildlife species, mainly from the construction of bikeway projects. Tables E-7-5 and E-7-6 in Appendix E-7 summarizes the project-by-project impact on listed plant and wildlife species that would occur by 2050.

Of species that have designated critical habitat, the species with the greatest amount of impacts on critical habitat as a result of transportation network improvements are coastal California gnatcatcher, San Diego fairy shrimp, arroyo toad, and least Bell's vireo; Otay tarplant would also receive large impacts (Table 4.4-12).

In addition to listed species, many non-listed special-status species would be impacted by forecasted regional growth and land use change because non-listed special-status species inhabit sensitive vegetation communities and regulated waters, including wetlands, that would be impacted, as described in Impact BIO-1. In general, non-listed special-status species that would be most impacted are those that inhabit the vegetation communities most impacted, including riparian forest/woodland, riparian scrub, meadows and seeps, chaparral, grasslands, forest/woodland, and coastal scrub. Appendices E-2 and E-3 describe the vegetation communities where non-listed special-status species may occur.

Indirect Impacts

The type and nature of indirect impacts would be the similar to those described for 2025 and 2035.

Summary

By 2050, the transportation network improvements projected in the proposed Plan would impact special-status species and their habitat. As discussed for 2025 and 2035, while adherence to the existing laws, regulations, and programs detailed in Section 4.4.2 would reduce impacts on special-status species, it cannot be concluded that impacts would be less than significant for all projects. Considering both direct and indirect impacts, ground-disturbing activities related to transportation network improvements under the proposed Plan would result in substantial adverse change to species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS, and habitat for these species. This is a significant impact.

2050 Conclusion

Implementation of the regional growth and land use change as well as transportation improvements and programs would result insubstantial adverse change to species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS, and habitat for these species-status species. Therefore, this impact (BIO-2) in the year 2050 would be significant.

Exacerbation of Climate Change Effects

The proposed Plan would exacerbate climate change effects on special-status species and their habitat. Changing temperature and precipitation patterns associated with climate change could force species to shift their ranges to survive, and species may diminish, die, or relocate to new habitats if their current habitats become inhospitable. For example, habitat fragmentation due to land use change and other factors associated with the proposed Plan may reduce the ability for species displaced by climate change to seek refuge (EcoAdapt 2017). Increased temperatures could also cause reduced fitness, increased mortality and reduced reproductive success, and alter timing of breeding, flowering, or emergence of pests and disease incidence (Jennings et al. 2018). Increased drought incidence can cause die-off of plants that serve as sources of food or shelter, and changing fire regimes may damage habitats or create conditions for invasive species to thrive (Jennings et al. 2018). Changes in plant biomass production due to reduced growth rates or increased mortality can also impact soil carbon sequestration levels and rates (Bradford et al. 2016, Ren et al. 2020). For aquatic species, warmer temperatures and changes in stream flow rates could degrade aquatic ecosystems and introduce invasive species (Jennings et al. 2018, California Natural Resources Agency 2009).

The proposed Plan is expected to affect the habitats of many special-status species, including the California gnatcatcher, San Diego fairy shrimp, arroyo toad, least Bell's vireo, and Otay tarplant. Climate change may also have an effect on some of these species:

- Climate change could threaten coastal sage scrub, which serve as habitat to the California gnatcatcher (Messner et al. 2011).
- Climate change may alter hydrology patterns, affecting riparian-dependent species such as the least Bell's vireo (Gardali et al. 2012).
- Hotter and drier conditions could reduce germination rates or misalign plant phenology with pollinator phenology for the Otay tarplant (USFWS 2009b).

Development could worsen these effects; habitat fragmentation due to land use change and other factors associated with the proposed Plan may reduce the ability for species displaced by climate change to seek refuge (EcoAdapt 2017). Some human activities could also worsen specific climate change risks, such as wildfire, due to the higher risk of human ignition from population and housing growth. Thus, development from the proposed Plan can exacerbate climate change effects on special-status species.

MITIGATION MEASURES

BIO-2 HAVE A SUBSTANTIAL ADVERSE EFFECT, EITHER DIRECTLY OR INDIRECTLY, ON ANY SPECIES IDENTIFIED AS A CANDIDATE, SENSITIVE, OR SPECIAL-STATUS SPECIES IN LOCAL OR REGIONAL PLANS, POLICIES, OR REGULATIONS, OR LISTED BY CDFW OR USFWS, INCLUDING THEIR FEDERALLY DESIGNATED CRITICAL HABITAT, OR SPECIES THAT ARE CONSIDERED SENSITIVE IN CEQA GUIDELINES SECTION 15380

2025, 2035, and 2050

Mitigation Measures **BIO-1a** through **BIO-1d** are also applicable to, and avoid, minimize, and mitigate impacts on, sensitive vegetation communities that provide habitat for special-status species.

BIO-2a Implement Design, Minimization, and Avoidance Measures for Special-Status Animal Species. During planning, design, project-level CEQA review, regulatory permitting process, and construction of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, incorporate measures to avoid and minimize impacts on special-status animal species.

Construction

Construction measures include, but are not limited to, the following:

- Avoid construction during the nesting or breeding season of special-status animal species.
- If the nesting or breeding season cannot be avoided, conduct focused surveys (by certified biologists approved by the Wildlife Agencies) and implement noise attenuation measures (e.g., temporary noise barriers) if construction noise levels are found by the focused survey to disturb special-status animal species, specifically during the breeding season.
- Backfill all wildlife pitfalls (trenches, bores, and other excavations) at the end of each work day. If backfilling is not feasible, slope all trenches, bores, and other excavations at a 3:1 ratio at the ends to provide wildlife escape ramps, or cover completely to prevent wildlife access.
- Delineate permitted work areas, including staging areas, equipment access, and placement of soils, with fencing or stakes prior to construction to prevent access to areas occupied by special-status species.
- Require monitoring of construction activities by qualified or certified biologists when construction occurs in, or adjacent to (i.e., within buffer areas approved by the regulatory agencies), areas suitable for or occupied by special-status species, with authority to stop work if it deviates from approved plans and mitigation measures. Avoidance buffers may vary by species and should be approved by the Wildlife Agencies.
- Avoid nighttime construction or minimize lighting. When activities must occur at night, direct lighting (e.g., staging areas, equipment storage sites, roadway) downward and away from sensitive vegetation communities. Use light glare shields to reduce the extent of illumination into adjoining areas.
- Remove spoils, trash, or any debris to an offsite, approved disposal facility. Contain trash and food items in closed containers and remove daily to reduce the attractiveness to opportunistic predators such as coyotes and feral dogs and cats that may prey on sensitive species. Prohibit workers from bringing pets and firearms to the site.

- Clear vegetation outside of the typical breeding season of special-status animal species as determined by the Wildlife Agencies or qualified biologist. If activities must occur during special-status species breeding season timeframes, conduct a preconstruction survey by a qualified biologist to determine whether the species of concern, including special-status birds protected under the MBTA, are present within the proposed work area or appropriate buffer (buffer distance may vary depending on the type of activity and the species and other site conditions). If the species of concern are found on site, implement measures, surveys, and construction monitoring to avoid impacts as determined by the regulatory agencies and/or the qualified biologist.

Operation and Maintenance

Operation and maintenance measures include, but are not limited to, the following:

- If permanent lighting is necessary, use motion sensitive lighting rather than steady burning, and direct downward and away from natural vegetation communities. Use light glare shields to reduce the extent of illumination into adjoining areas.
- In the event that vegetation clearing or other vegetation maintenance is required, schedule vegetation clearing outside special-status animal species breeding seasons.
- Implement operational noise reduction measures described in Section 4.13, *Noise and Vibration* (see mitigation measure N-1a).

BIO-2b Provide Compensatory Mitigation for Special-Status Plant Species. Where impacts are unavoidable, during planning, design, regulatory permitting, and project-level CEQA review of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, provide compensatory mitigation for impacts on special-status plant species as specified through consultation with resource agencies, and consistent with ~~approved~~adopted MSCP or MHCP guidelines and agreements, federal and State regulatory requirements, or local regulations.

Federally and/or State-Listed Plant Species

- If an individual project would result in take of a federally and/or state-listed plant species, consult with the Wildlife Agencies and/or require the applicant to obtain appropriate take authorizations (e.g., Section 2081 Incidental Take Permit, NCCP, Section 7, Section 10 HCP) prior to construction as required by State and federal law. Federally listed plant species may not fall under this requirement if no federal project nexus is provided. If the area is covered by an ~~approved~~adopted NCCP (e.g., MSCP, MHCP), provide mitigation pursuant to the requirements of the NCCP, subarea plan, and associated ordinances and guidelines.
- Establish appropriate habitat mitigation ratios—depending on the location of the impact and the species—that are also consistent with the requirements of resource agencies and applicable adopted plans, ordinances, and policies that include the appropriate habitat, area, and species in compensation lands. If appropriate, require the applicant to acquire suitable mitigation habitat as part of the SANDAG EMP or use a mitigation bank or in lieu fee program to compensate for impacts.
- Prepare a species and habitat mitigation plan to identify effective methods for reestablishing the affected species and habitat, including, but not limited to, seed collection, salvage of root masses, translocation of transplantation of populations or plant parts, and planting seeds and/or root masses in an area with suitable conditions as approved by the Wildlife Agencies or authorized jurisdiction. Include in the

mitigation plan success criteria for reestablishing the affected species and habitat, and remedial measures that must be implemented if the project is not meeting specified performance criteria.

- Include a monitoring program designed to maintain the resources on lands used as mitigation. Design the monitoring program to evaluate the current and probable future health of the resources, and their ability to sustain populations following the completion of the program.
- Design remedial measures appropriate for the species and habitat. Appropriate remedial measures include, but are not limited to, exotic species management, access control, replanting and reseeding of appropriate habitat elements, and propagation and seed bulking programs.
- Conserve any restoration and translocation sites in perpetuity, fund a long-term management endowment, identify a long-term habitat manager, and provide long-term adaptive habitat management measures through a Habitat Management Plan.

Non-Federally and/or Non-State-Listed Special-Status Plant Species

- For plant species covered by adopted NCCPs or other ordinances such as the San Diego County RPO, obtain all appropriate authorizations prior to construction as required by state, federal, and regional conservation plan (NCCP/HCP) regulations and local ordinances. This may include species-specific mitigation for covered narrow endemic plant species pursuant to MSCP or MHCP requirements.
- Mitigate loss of habitat using mitigation banks or through project-specific mitigation. Mitigate habitat impacts through preservation, translocation/transplantation, restoration, or creation of self-sustaining suitable habitat as described above for federally and state-listed species. Establish appropriate habitat mitigation ratios, depending on the location of the impact and the species, to meet the requirements of resource agencies and applicable adopted plans, ordinances, and policies.

BIO-2c Provide Compensatory Mitigation for Special-Status Animal Species. Where impacts are unavoidable, during planning, design, regulatory permitting, and project-level CEQA review of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, provide compensatory mitigation for impacts on special-status animal species as specified through consultation with resource agencies, and in ~~approved~~adopted MSCP or MHCP guidelines and agreements, federal and State regulatory requirements, or local regulations.

Federally and/or State Listed Animal Species

- If an individual project would result in take of a federally and/or state-listed animal species, consult with the Wildlife Agencies and/or require the project applicant to obtain appropriate take authorizations (e.g., Section 2081 Incidental Take Permit, Section 7, NCCP, HCP) prior to construction as required by State and federal law. If the area is covered by an ~~approved~~adopted NCCP (e.g., MSCP, MHCP), provide mitigation pursuant to the requirements of the NCCP, subarea plan, and associated ordinances and guidelines. As identified through the appropriate take authorizations, develop mitigation plans and long-term conservation and management strategies, as required and approved by the Wildlife Agencies.
- Mitigate loss of habitat through open space conservation, using mitigation banks (as available) or through project-specific mitigation. Mitigate habitat impacts through preservation, restoration, or creation of self-sustaining suitable habitat following the most recent scientific information and guidance available.
- Establish appropriate habitat mitigation ratios—depending on the location of the impact and the species—that are also consistent with the requirements of resource agencies and applicable adopted NCCP plans,

ordinances, and policies that include the appropriate habitat, area, and species in compensation lands. If appropriate, require the applicant to acquire suitable mitigation habitat as part of the SANDAG EMP or use a mitigation bank or in lieu fee program to compensate for impacts.

- Prepare a species and habitat mitigation plan to identify effective methods for reestablishing the affected species and habitat based on available scientific information and as recommended by the respective species experts. If appropriate and approved by the regulatory agencies, mitigation may include translocation (active or passive) of the species. Include in the mitigation plan success criteria for reestablishing the affected species and habitat, and remedial measures that must be implemented if the project is not meeting specified performance criteria.
- Include a monitoring program designed to maintain the resources on lands used as mitigation. Design the monitoring program to evaluate the current and probable future health of the resources, and their ability to sustain populations following the completion of the program.
- Design remedial measures appropriate for the species and habitat. Appropriate remedial measures include, but are not limited to, exotic species management, access control, habitat restoration, and predator control programs.

Non-Federally and/or Non-State-Listed Special-Status Animal Species

- Obtain all appropriate authorizations prior to construction as required by state, federal, and regional conservation plan (NCCP/HCP) regulations and local ordinances (such as the County RPO).
- Follow guidelines that identify mitigation requirements, such as local biology guidelines and mitigation ordinances, or Memoranda of Understanding (MOU) between the respective jurisdiction and Wildlife Agencies.
- Mitigate loss of habitat using mitigation banks or through project-specific mitigation. Mitigate habitat impacts through preservation, restoration, or creation of self-sustaining suitable habitat. Create species-specific breeding opportunities and protect mitigation areas from edge effects (e.g., roadkill). Establish appropriate habitat mitigation ratios, depending on the location of the impact and the species, to meet the requirements of resource agencies and applicable adopted plans, ordinances, and policies.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of mitigation measures BIO-1a through BIO-1d, and BIO-2a through BIO-2c would reduce this impact (BIO-2). However, there is no assurance that these mitigation measures would be implemented for all projects or be equally effective due to the wide variety of circumstances, complexity of some sites, and complexity of impacts on them. Therefore, this impact (BIO-2) would remain significant and unavoidable.

BIO-3 INTERFERE SUBSTANTIALLY WITH THE MOVEMENT OF ANY NATIVE RESIDENT OR MIGRATORY FISH OR WILDLIFE SPECIES OR WITH ESTABLISHED NATIVE RESIDENT OR MIGRATORY WILDLIFE CORRIDORS, OR IMPEDE THE USE OF NATIVE WILDLIFE NURSERY SITES

ANALYSIS METHODOLOGY

Regional Growth and Land Use Change

Direct Impacts

Regional corridor impacts are analyzed by broadly reviewing regional growth and land use change across the region and qualitatively and quantitatively assessing impacts on the wildlife movement corridors described in Section 4.4.1. The review is based on modeled wildlife movement corridors across San Diego County (Jennings et al. 2020, SDSU 2019). Site-specific wildlife movement studies are only available for a small number of isolated projects (e.g., County of San Diego Wildcat Canyon Road and Valley Center Road, SR 94 near Rancho Jamul Ecological Reserve) or planning areas (e.g., City of Carlsbad wildlife movement study). However, wildlife usually moves across large expanses of the landscape, and site-specific information may overlook comprehensive movement corridors and connections. Therefore, for the purpose of the programmatic analysis appropriate for this EIR, the discussion identifies regional corridors that occur in areas that would experience extensive land use change and development. Mapped movement corridors from SDSU's Multi-Species Linkages and Climate Resilient Connectivity Prioritized Linkage Network (SDSU 2019) (see Figure 4.4-15) were overlaid with the GIS layers for those areas that would be converted to developed land uses for each horizon year (see *Regional Growth and Land Use Change* under Impact BIO-1, *Analysis Methodology*). This overlay is used to qualitatively and quantitatively identify where potential conflicts with mapped wildlife corridors could occur. Wildlife nursery sites are generally discussed to note species in Southern California that use specific vegetation communities for nursery sites (i.e., areas for raising offspring). Any direct impact on regional or local wildlife corridors is considered a "substantial adverse effect" on the movement of resident or migratory fish or wildlife species because it could significantly affect the survival of the species and preclude wildlife movement for the purpose of climate change adaption.

Indirect Impacts

Indirect impacts that may occur on wildlife corridors in proximity to the areas experiencing regional growth and land use change are qualitatively described on a broad scale. Indirect impacts include noise and light levels that would preclude animals from traveling through a given area. Wildlife movement corridors that lead to a dead end or that would increase roadkill risk (i.e., through lacking or inadequately planned or constructed directional fencing) would also be considered an indirect impact as this could increase mortality or impact breeding success.

Transportation Network Improvements and Programs

Direct Impacts

Regional corridor impacts were quantitatively analyzed by overlaying the transportation network footprint on the modeled wildlife movement network developed by SDSU (SDSU 2019) and by reviewing the intersection of the transportation network improvements with mapped wildlife movement corridors described in Section 4.4.1. The analysis overlays the transportation project footprints (see *Transportation Network Improvements and Programs* under Impact BIO-1, *Analysis Methodology*) with the mapped movement corridors described above to calculate where potential conflicts with mapped wildlife corridors could occur. The discussion identifies specific regional corridors that occur in areas with transportation network improvements for each horizon year and quantifies the acreage that could potentially be impacted by the transportation network

improvement program's linear projects. The impact analysis also considers corridors as they relate to movement to and from wildlife nursery sites used by avian, bat, fish, and amphibian species.

Indirect Impacts

Indirect impacts that may occur on wildlife corridors in proximity to the areas subject to transportation network improvements are qualitatively described on a broad scale, and are similar to those described under regional growth and land use change indirect impacts.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Direct Impacts

Direct impacts on wildlife corridors reflect physical changes to the corridor itself and typically include the direct removal of habitat or the creation of obstructions that would bisect linear wildlife movement corridors and prevent wildlife from moving across their dispersal habitats. Direct impacts on wildlife corridors are those actions that result in the elimination of a corridor, the creation of a barrier across a corridor, the widening of a barrier, the lengthening of a corridor that might preclude wildlife from reaching habitat, or the narrowing of a corridor through removal of habitat and/or topographical changes. Removal of habitat that narrows wildlife corridors and/or increases the distance wildlife would have to travel through, under, and/or over the urban matrix created by regional growth/land use change and transportation network improvements is a direct impact. Riparian corridors through developed areas are critical to regional connectivity if they function properly and do not result in an ultimate reduction of productivity (e.g., ecological sink). For example, direct impacts on corridors, including urban and riparian corridors, fragment the landscape and can impact species by isolating populations. Additionally, direct impacts on aquatic habitat from dams, diversions, grade-control structures, and highway crossings in streams can inhibit movements of resident or migratory fish and fragment aquatic habitat for native aquatic wildlife. These structures can prevent aquatic species' access to spawning and rearing habitats. Finally, some species in Southern California use specific vegetation communities for nursery sites (i.e., areas for raising offspring). Amphibian species, in particular, require access to upland habitat for foraging and wintering habitat and return to riparian habitat to breed. Other species, such as bats and birds, use particular areas to establish maternity or breeding colonies. Direct impacts adjacent to these areas or between foraging/wintering habitat and breeding habitat can impede the use of these nursery sites.

Direct impacts on wildlife corridors would result from the projects implementing the proposed Plan. Regional growth would constrain some regional movement corridors and eliminate or narrow corridors and further decrease the permeability of existing barriers. Furthermore, the transportation system improvements linked with regional growth and land use change threaten wildlife populations due to highway mortality (Forman and Alexander 1998, Lodé 2000, Trombulak and Frissell 2000). Vehicle collisions have been documented as a major source of mortality for coyotes and bobcats (Tigas et al. 2002), mule deer (Reed 1981), and mountain lions (Dickson and Beier 2002).

The regional growth and land use change expected by 2025 would increase human disturbances, noise, and/or lighting and would directly and indirectly impact several corridors, including some identified in the SDSU Climate Resilient Corridors, South County MSCP, and South Coast Missing Linkage studies. Many of the impacted corridors are already identified as being constrained, and further impacts would reduce corridor

function. In particular, spaced rural residential development would further reduce corridor function of the linkages identified in the South County MSCP between Otay Lakes/Otay Mesa/Otay River Valley and South San Diego Bay Silver Strand.

The quantification of reginal growth and land use change impacts on wildlife movement are substantially overestimated due to source data, which were modeled and included already developed areas. The corridors identified by the Las Californias Binational Conservation Initiative between the United States and Mexico would be relatively unaffected by regional growth and land use change because planned development in the U.S. spatially connects with existing development on the Mexico side of the border. The Pacific Flyway and Audubon IBAs would also be largely unaffected by the proposed Plan because most of the movement occurs across the Pacific Ocean, and resting places for water fowl and IBAs would remain mainly undeveloped.

Indirect Impacts

Indirect impacts on wildlife corridors reflect changes that reduce the suitability of corridors for species that use them. Corridors with degraded functionality can result in species choosing not to use the corridor or in increased rates of mortality or reduced reproduction rates among those individuals that do choose to use the corridor. When the rate of mortality a species experiences within a corridor exceeds the breeding and health benefits provided by the corridor, it acts as a population sink for the species.

Indirect impacts on wildlife corridors would occur as a result of increased human disturbance, noise, and/or lighting due to regional growth and land use change. As noted in Section 4.4.1, riparian corridors are important to regional connectivity in Southern California and often are the only connections left to large core habitat patches. Increased human presence and/or density, noise, and/or lighting may deter wildlife species from using wildlife corridors, including riparian corridors, and impede use of wildlife nursery sites. Indirect impacts driven by edge effects on corridors vary depending on the scale of the corridor. Most edge effects have a given range of influence from the source. A given edge effect (e.g., lighting) may affect the entire width of a narrow local corridor and thus seriously impede its function, but would reach only a short distance into a wide corridor and thus have a negligible effect on its function.

As discussed above, many terrestrial species can utilize agricultural land that is adjacent to native habitat for supplemental forage or cover depending on the intensity and type of the agricultural activity present. Additionally, agricultural land situated between native habitat patches can provide movement corridors for terrestrial species. Conversion of agricultural land to urban uses further limits wildlife movement through these areas. Dredge and fill activities in riverine and riparian habitats can affect fisheries habitat in a number of ways. Indirect impacts can include changes in water flow rates, water quality, and increased predation and can lead to the loss or deterioration of upstream or downstream habitat. These negative changes can be detrimental to upstream and downstream fish migration.

Increased predation from domestic animals and/or mesopredators adapted to urban conditions makes it less likely native species would survive while using a corridor. Roads can function as a particularly hostile matrix to native wildlife species, at times forming an impenetrable barrier to necessary movement. Negative indirect effects of highways on wildlife can include habitat fragmentation and changes in movement and distribution patterns (Trombulak and Frissell 2000, Schaefer et al. 2003, Brehme et al. 2013). Additional effects of roads can also include alteration of chemical environment, spread of exotic species, and increased alteration and use of habitat by humans (Trombulak and Frissell 2000). There have been many studies of carnivores in Southern California reflecting various responses to habitat fragmentation and roads (Crooks 1999, 2002; Crooks and Soule 1999; Lyren 2001; Fedriani et al. 2000; Tigas et al. 2002; Riley et al. 2003; Riley 2006; George and Crooks

2006; Lyren et al. 2006; Riley et al. 2006; Morin 2007). These responses include changes in behavior as well as patterns of spatial occurrence.

Even in regionally preserved core areas of Southern California, continued development and road construction negatively impact and alter general movement patterns and survival of some native species (Lyren et al. 2006). Riley et al. (2006) found a Southern California freeway, US-101, to operate as a genetic barrier to both bobcats and coyotes, suggesting that, even when these animals are crossing the highway, there is still a social barrier reflected in a lack of reproductive success of migrants. These genetic consequences threaten overall population health despite limited structural connectivity. The fact that coyotes, a common, adaptive, and opportunistic predator, are impacted by fragmentation indicates the effects on other more sensitive species may be even more pronounced.

Summary

As discussed in Section 4.4.2, numerous federal, state, and local laws, regulations, and programs are in place that protect sensitive species; however, wildlife movement corridor conservation is not mandated by any federal regulations, and only recommended on the State level where wildlife movement corridors are identified. Federal laws and regulations including FESA, MBTA, and BGEPA specifically protect federally listed species, migratory birds, and eagles, and State laws and regulations, including CESA and CFGC, protect state-listed and other sensitive species and their habitats. The local NCCP and HCP programs implemented in the San Diego region identify core and linkage areas, protect linkages, and provide a process to strategically facilitate connectivity between open space habitats (cores). Conservation of agricultural lands discussed in Section 4.2 may help to maintain connectivity in some locations because many avian species and medium to large mammal species can utilize agricultural lands as habitat for foraging and/or temporary cover to traverse between native habitats.

While adherence to the existing federal, state, and local laws, regulations, and programs discussed in Section 4.4.2 would reduce impacts on wildlife movement, it cannot be concluded that adherence would result in less-than-significant impacts for all projects. Considering both direct and indirect impacts, land use change under the proposed Plan would interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. This is a significant impact.

Transportation Network Improvements and Programs

Direct Impacts

The types and nature of direct impacts that may occur on wildlife movement are similar to those discussed above for regional growth and land use change. However, whereas regional growth and land use change impacts on wildlife movement occur on a landscape-level in the form of development and local access and connector roads, the impacts of the linear transportation network improvements would cause an overall increase in the barriers to wildlife corridors. Highways and rail alignments pose significant barriers to the movement of animals, particularly as traffic volumes increase to support increasing populations.

Transportation network improvements that would impact wildlife corridors are planned for existing highways, transit projects, or arterials that already act as wildlife barriers. Widening these transportation corridors would not necessarily cut off these corridors because bridges that would be widened would ~~likely~~ be designed to allow for continued wildlife movement. However, as discussed above for regional growth and land use change, they may make existing crossings less attractive for use by wildlife species, and the greater width may lead to

additional highway mortality for terrestrial and avian species that attempt to cross transportation corridors at grade. Specific locations and quantifications of where the transportation network's linear projects might be in conflict with wildlife movement corridors and linkages are presented in Table 4.4-13.

Table 4.4-13
Forecasted Encroachments Into Wildlife Movement Corridors and Linkages Within the San Diego Region (acres) up to the Year 2025

Corridor and Linkage Categories	Regional Growth and Land Use Change	Transportation Network Improvements	Total
SDSU Climate Resilient Wildlife Movement Corridors	2,852	9	2,861
MSCP Core and Linkages	3,730	26	3,756
MHCP Core and Linkages (BCLA)	77	2	79
Total	**6,~~582~~659**	**~~35~~37**	**6,~~617~~696**

The majority of transportation network improvements in the 2025 horizon year are arterials and local connectors. These are existing roads in highly urbanized areas and do not cross canyons or riparian areas that provide movement corridors for wildlife. Some specific examples of arterial projects that would impact riparian corridors include Via de la Valle over Escondido Creek, including bridge widening that could potentially impact wildlife movement along Escondido Creek; the widening of El Camino Real in Carlsbad over Batiquitos Lagoon, and El Camino Real where it crosses San Dieguito River; Dye Road to San Vicente Road, and road extension from Boundary Avenue to Warnock Drive in Ramona; the Carlton Oaks segment across the San Diego River; the H Street extension on H Street marsh; the Heritage Road Bridge where it crosses the Otay River; Otay Lakes Road around the Upper Otay Lake; and the widening of La Media Road south of SR 905.

Bikeways would have relatively little impact on corridors as most are within or directly adjacent to developed areas; however, the Bayshore Bikeway from Ada Street to Palomar Street affects the MSCP Linkages. The increased presence of humans in some riparian areas (e.g., Coastal Rail Trail, San Diego River Trail) may alter wildlife behavior in excess of current conditions, ~~but~~ considering that these areas are already heavily disturbed by human presence.

Indirect Impacts

The type and nature of indirect impacts would be the same as those described above for regional growth and land use change.

Summary

By 2025, the transportation network improvements projected in the proposed Plan would impact wildlife movement. As discussed for the regional growth and land use change, adherence to the existing federal, state, and local laws, regulations, and programs discussed in Section 4.4.2 would reduce impacts on wildlife movement; however, it cannot be concluded that adherence would result in less-than-significant impacts for all projects. Considering both direct and indirect impacts, transportation network improvements under the proposed Plan would interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. This would be a significant impact.

2025 Conclusion

Implementation of the regional growth and land use change as well as transportation improvements and programs would interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. Therefore, this impact (BIO-3) in the year 2025 would be significant.

2035

Regional Growth and Land Use Change

Direct Impacts

The types and nature of the direct impacts that may occur on wildlife movement by 2035 are similar to 2025. By 2035, as discussed for 2025, regional growth and land use change would directly and indirectly impact several corridors, specifically by spaced rural residential development such as the corridor between Otay Mountain and Cleveland National Forest and riparian corridors along the San Luis Rey River and Santa Margarita River.

Indirect Impacts

The type and nature of indirect impacts that may occur on wildlife movement are similar to those in 2025.

Summary

As discussed for 2025, while adherence to the existing laws, regulations, and programs detailed in Section 4.4.2 would reduce impacts on wildlife movement, it cannot be concluded that adherence would result in less-than-significant impacts for all projects. Considering both direct and indirect impacts, land use change under the proposed Plan would interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. This is a significant impact.

Transportation Network Improvements and Programs

Direct Impacts

The types and nature of direct impacts that may occur on wildlife movement by 2035 are similar to 2025. However, the transportation network improvement impacts for the 2035 horizon year are significantly larger than those planned for the 2025 horizon year. Additional lanes and improvements planned along major highways by 2035 would impact wildlife corridors and linkages, including riparian corridors as a result of bridge crossings or existing bridge widenings. Transportation network improvements that would impact wildlife corridors are planned for existing highways, transit projects, or arterials that already act as wildlife barriers. Widening these transportation corridors would not necessarily cut off these corridors because bridges that would be widened would likely be designed to allow for continued wildlife movement. However, as discussed above for regional growth and land use change in 2025, they may make existing crossings less attractive for use by wildlife species, and the greater width may lead to additional highway mortality for terrestrial and avian species that attempt to cross transportation corridors at grade. Conflicts between wildlife movement corridors and linkages from the linear transportation network projects are presented in Table 4.4-14.

Table 4.4-14
Forecasted Encroachments Into Wildlife Movement Corridors and Linkages Within the San Diego Region (acres) 2026-2035

Corridor and Linkage Categories	Regional Growth and Land Use Change	Transportation Network Improvements	Total
SDSU Climate Resilient Wildlife Movement Corridors	2,640	56	2,696
MSCP Core and Linkages	325	498	823
MHCP Core and Linkages (BCLA)	23	15	38
Total	**2,98685**	**554569**	**3,519557**

Almost the entire planned transportation network could potentially affect regional wildlife corridors and linkages. MSCP linkages are conflicted by the Bayshore Bikeway, Coastal Rail Trail, San Diego River Trail, and segments of Complete Corridors, including I-15 at Clairemont Mesa Boulevard; I-805 at Nobel Drive; SR 125 from SR 54 to SR 905; SR 52 through Mission Trails Regional Park, Kearny Mesa, and from I-805 to I-15; I-15 from I-8 to SR 163; I-805 from Balboa Avenue to SR 905; SR 905 to the border; and intermittently the entire I-5 corridor. Rural Complete Corridors that affect wildlife movement include SR 76 at Cole Grade Road and Pauma Reservation Road; I-8 to West Willows Road; and SR 94 intersection improvement at Jamacha and Melody Road.

The majority of arterials are existing roads in highly urbanized areas and do not cross canyons or riparian areas that provide movement corridors for wildlife. Specific examples of arterial projects that would impact riparian corridors include El Camino Real from La Costa Avenue to Arenal Road where it crosses San Marcos Creek, El Camino Real where it crosses San Dieguito River, the Willow Street Bridge Project from Bonita Road to Sweetwater Road where it crosses Sweetwater River, and the Heritage Road Bridge where it crosses the Otay River. Bikeways would have relatively little impact on corridors as most are within or directly adjacent to developed areas. The increased presence of humans in some riparian areas ~~(e.g., Coastal Rail Trail, San Diego River Trail)~~ may alter wildlife behavior relative to current conditions, ~~but~~ considering that ~~these~~ many areas are already heavily disturbed by human presence.

Indirect Impacts

The type and nature of indirect impacts that may occur on wildlife movement by 2035 are similar to 2025.

Summary

By 2035, the transportation network improvements projected in the proposed Plan would impact wildlife movement. As discussed for 2025, while adherence to the existing laws, regulations, and programs detailed in Section 4.4.2 would reduce impacts on wildlife movement, it cannot be concluded that adherence would result in less-than-significant impacts for all projects. Considering both direct and indirect impacts, transportation network improvements under the proposed Plan would interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. This is a significant impact.

2035 Conclusion

Implementation of the regional growth and land use change as well as transportation improvements and programs would interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. Therefore, this impact (BIO-3) in the year 2035 would be significant.

2050

Regional Growth and Land Use Change

Direct Impacts

The types and nature of the direct impacts that may occur on wildlife movement by 2050 are similar to 2025 and 2035. By 2050, as discussed for 2025 and 2035, regional growth and land use change would directly and indirectly impact several corridors. Spaced rural residential development would further impact the corridors already identified as impacted in 2025 and 2035.

Indirect Impacts

The type and nature of indirect impacts that may occur on wildlife movement are similar to 2025 and 2035.

Summary

As discussed for 2025 and 2035, while adherence to the existing laws, regulations, and programs detailed in Section 4.4.2 would reduce impacts on wildlife movement, it cannot be concluded that adherence would result in less-than-significant impacts for all projects. Considering both direct and indirect impacts, land use change under the proposed Plan would interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. This is a significant impact.

Transportation Network Improvements and Programs

Direct Impacts

The types and nature of direct impacts that may occur on wildlife movement by 2050 are similar to 2025 and 2035. The 2050 horizon year impacts from transportation network improvements are similar in nature but slightly less than those of the 2035 horizon year. Additional lanes and improvements planned along major highways by 2050 would impact riparian corridors. Transportation network improvements that would impact wildlife corridors are planned for existing highways, transit projects, or arterials that already act as wildlife barriers. Widening these transportation corridors would not necessarily cut off these corridors because bridges that would be widened would likely be designed to allow for continued wildlife movement. However, as discussed above for regional growth and land use change, they may make existing crossings less attractive for use by wildlife species, and the greater width may lead to additional highway mortality for terrestrial and avian species that attempt to cross transportation corridors at grade. Conflicts between wildlife movement corridors and linkages from the linear transportation network projects are presented in Table 4.4-15.

Table 4.4-15
Forecasted Encroachments Into Wildlife Movement Corridors and Linkages Within the San Diego Region (acres), 2036-2050

Corridor and Linkage Categories	Regional Growth and Land Use Change	Transportation Network Improvements	Totals
SDSU Climate Resilient Wildlife Movement Corridors	2	155	157
MSCP Core and Linkages	191	~~285~~288	~~476~~479
MHCP Core and Linkages	7	15	22
Total	**~~193~~200**	**~~440~~458**	**~~633~~658**

Segments of highways that would impact corridors include the Complete Corridor on I-15 across the Santa Ana-Palomar linkage. A significant bottleneck already exists in the link from the Santa Ana Mountains, Palomar Mountains, and inland ranges to the Cleveland National Forest and MCB Camp Pendleton, and a specifically wildlife movement and corridor planning study has been discussed for this linkage. The Complete Corridor on SR 56 (I-5 to I-15) along Carmel Valley between Sorrento Mesa and Fairbanks Ranch would also conflict with modeled wildlife movement corridors, as would the Complete Corridor on SR 76 to Pala Mission Road and Deer Canyon Drive. The San Luis Rey River Trail to I-15 along San Luis Rey River would potentially affect wildlife movement for many federally and state-listed species along the entire reach of the planned improvements.

Bikeways in 2050 would have relatively little impact on corridors as most are within or directly adjacent to developed areas. The increased presence of humans in some riparian areas may alter wildlife behavior, but these areas are already heavily disturbed by human presence.

Indirect Impacts

The type and nature of indirect impacts that may occur on wildlife movement by 2050 are similar to 2025 and 2035.

Summary

By 2050, the transportation network improvements projected in the proposed Plan would impact wildlife movement. As discussed for 2025 and 2035, while adherence to the existing laws, regulations, and programs detailed in Section 4.4.2 would reduce impacts on wildlife movement, it cannot be concluded that adherence would result in less-than-significant impacts for all projects.

Considering both direct and indirect impacts, transportation network improvements under the proposed Plan would interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. This is a significant impact.

2050 Conclusion

Implementation of the regional growth and land use change as well as transportation improvements and programs would interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. Therefore, this impact (BIO-3) in the year 2050 would be significant.

Exacerbation of Climate Change Effects

The proposed Plan could exacerbate potential climate change effects on movement of fish or wildlife species or wildlife corridors. Climate change could increase the rate at which plant and animal species require corridors by rapidly changing temperature and precipitation patterns and thus altering habitats. Vegetation especially may not be able to move as quickly to keep up with changing climate, and some habitats may expand while others are lost (Moser et al. 2012). Increased temperatures and drought could also affect the Pacific Flyway, which encompasses the San Diego region and provides areas for migratory birds to stop and feed (Murphy 2018). Climate change could also affect migratory corridors themselves, as changes to temperature, precipitation, drought, and wildfire patterns may affect the vegetation that comprises corridors and fragment or completely remove them.

Development from the proposed Plan could worsen these effects; habitat fragmentation due to land use change, transportation network improvements, and other factors associated with the proposed Plan may interfere more with habitat and migratory corridors and reduce the ability for species displaced by climate change to seek refuge (EcoAdapt 2017). Some human activities could also worsen specific climate change risks, such as wildfire, due to the higher risk of human ignition from population and housing growth associated with the proposed Plan. Thus, development from the proposed Plan can exacerbate climate change effects on migratory corridors.

MITIGATION MEASURES

BIO-3 INTERFERE SUBSTANTIALLY WITH THE MOVEMENT OF ANY NATIVE RESIDENT OR MIGRATORY FISH OR WILDLIFE SPECIES OR WITH ESTABLISHED NATIVE RESIDENT OR MIGRATORY WILDLIFE CORRIDORS, OR IMPEDE THE USE OF NATIVE WILDLIFE NURSERY SITES

2025, 2035, and 2050

BIO-3~~a Design Projects to~~ Facilitate Wildlife Movement. During planning, design, and project-level CEQA review of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, implement project designs that provide for continued movement of wildlife by limiting edge effects and assisting wildlife navigation through or across barriers in areas where wildlife corridors and nursery sites are impacted, as determined by best available information, modeled wildlife corridors, linkages identified in adopted HCP/NCCPs, studies conducted by San Diego Management and Monitoring Program in collaboration with the USGS Biological Resource Division, or project-specific wildlife movement studies. Conduct wildlife movement studies and Before-After-Control-Impact-Studies (BACI) where data are lacking, identify corridor widths and wildlife crossing structures, and consider balancing conservation and recreation (Mitrovich et al. 2020) in project design. Include adaptive management and monitoring measures in the CEQA review, mitigation measures, and project design. Design measures include, but are not limited to, the following:

- Allow corridor buffer zones and wide movement corridors to remain or incorporate periodic larger habitat patches along a corridor's length.
- Where feasible, site linear projects, including pedestrian trails, away from wildlife corridors and conserved lands or NCCP lands.

- Where feasible, prohibit night-time trail use and enforce seasonal trail closure, and plan access points and infrastructure carefully to minimize the effects on biological resources and wildlife corridors.
- As feasible, within 200 feet of a wildlife corridor, use non-reflective glass or glass treated with non-reflective coating for all exterior windows and building surfaces.
- Use only native species for landscaping within at least 200 feet of identified wildlife corridors.
- Incorporate dimmed, shielded, and directed lighting in areas near corridors that only illuminate the project site; consider high pressure sodium or cut-off fixtures as feasible, and provide vegetative screening to reduce light pollution on corridors.
- Include permanent noise barriers and sound-attenuating features as part of the project design, and incorporate temporary noise barriers and noise-reduction devices on equipment during construction; require the use of hydraulically or electrically powered tools, as feasible. Barriers could be in the form of outdoor barriers, sound walls, buildings, or earth berms to attenuate noise at adjacent sensitive uses.
- Install physical barriers (e.g., wildlife fencing) that prevent human and/or domestic predator entry into the corridor and, if appropriate, limit the amount of noise and lighting that enters the corridor. Use techniques such as grade separation, buffer zones, landscaped berms, dense plantings, sound walls, reduced-noise paving materials (i.e. rubberized asphalt), and traffic calming measures.
- Minimize the number of road crossings through identified wildlife corridors.
    - Incorporate the appropriate wildlife crossing infrastructure into project design. Wildlife crossing infrastructure will be designed following the latest scientific information, and should include upgrading existing culverts to facilitate functional wildlife movement, installing crossing and directional fencing at roadkill hotspots, installing wildlife bridges or undercrossing, and managing in perpetuity both sides of the wildlife crossings. Construct or retrofit with features such as open span bridges instead of closed culverts to allow for wildlife movement under linear transportation corridors.
    - If the construction of or retrofitting with wildlife bridges is infeasible, incorporate undercrossings and/or other crossing structures that use scientifically accepted openness ratios to allow for continued movement of wildlife where transportation facilities create barriers to wildlife movement and use of nursery sites. Evaluate size-class–specific crossing structures and movement enhancement features (e.g., habitat refugia within structure, soft bottom undercrossings) for each species to ensure that crossings are functional for movement. Additionally, within aquatic habitat impacting fish corridors for species such as southern steelhead, create passable aquatic barriers for migratory fish species in order to provide fish access to spawning and rearing habitats.
    - Maintain undercrossings and/or other crossing structures as needed to ensure wildlife movement. Prepare a fencing and wildlife crossing structure maintenance plan for projects with edge effects to maintain permeability for wildlife across corridors.
    - Install directional fencing, where appropriate, to reduce vehicle mortality and guide wildlife to proposed bridges, undercrossings, and/or other crossing structures. Where fencing stops, extend the fence and angle it away from the roadways to deter wildlife from being funneled to roadways. Because it is not possible to install a continuous fence, use one-way gates or jump-outs so animals that do get around fence end runs can safely exit roadways.

The inclusion of the above design features should result in an equal or net-benefit to wildlife movement compared to existing conditions.

In addition, ~~**BIO-3b** p~~Pursuant to the California Ecosystems Protection Act (AB 1788), ban the use of anticoagulant rodenticides near open space, conserved lands and areas identified as core, linkages, wildlife corridors, or other connectivity areas. The use of anticoagulant rodenticides causes secondary poisoning in predators and may contribute to reduced functional connectivity in an already constrained landscape.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of mitigation measure BIO-3 would reduce this impact (BIO-3). However, there is no assurance that this mitigation measure would be implemented for all projects or equally effective due to the wide variety of circumstances, complexity of some sites, and complexity of impacts on them. Therefore, this impact (BIO-3) would remain significant and unavoidable.

BIO-4 CONFLICT WITH THE PROVISIONS OF AN ADOPTED HCP, NCCP, OR OTHER CONSERVATION PLAN, OR WITH ANY LOCAL POLICIES OR ORDINANCES PROTECTING BIOLOGICAL RESOURCES

ANALYSIS METHODOLOGY

Implementation of the proposed Plan would comply with the provisions of all approved local, regional, state, and federal regulations, policies, ordinances, and finalized conservation plans (HCP/NCCP, specifically the MSCP and MHCP and their respective subregional plans).

The locally adopted MSCP and MHCP and their respective subregional plans identify and map lands that are targeted for conservation in the future but within which some development is allowed (i.e., softline preserves, partial land conservation targets, PAMA, etc.). By the year 2025, additional draft NCCPs and subregional plans (e.g., the City of Oceanside Draft MHCP Subarea Plan and the County of San Diego North County MSCP) would likely be approved. These conservation plans describe the processes by which future development impacts on target habitats and species both inside and outside preserves are evaluated and approved while meeting conservation targets. The proposed Plan is designed to follow the policies and procedures of the adopted MSCP and MHCP (City of San Diego 1998 and SANDAG 2003, respectively) and their adopted subregional plans, and it can be assumed that all development within the plan areas would comply with all associated guidelines and ordinances, and that project-specific review and analysis would ensure compliance. Furthermore, plans such as the South County MSCP have specific accommodations for implementation of the adopted circulation network.

It should be noted that the MSCP IA is a 50-year permit issued by the USFWS and CDFW. The IAs for the Poway Subarea Plan (1996), the County of San Diego MSCP (1997), and the City of San Diego Subarea Plan (1997) expire prior to the 2050 horizon year. The County applied for an amendment to the MSCP in 2020. This EIR assumes that the IA for each plan would be amended and extended past the 2050 horizon year. For the purpose of this EIR it is assumed that all permits associated with the MSCP and its subarea plans (e.g., City of Poway 1996, both the County and City of San Diego 1997) would be renewed, and the analysis for the horizon year 2050 was conducted accordingly.

The analysis methodology includes a quantitative analysis of potential encroachment into ~~hardline preserves~~MSCP and MHCP Preserves (i.e., areas currently protected, or partially protected, from development ~~and~~ or permanently conserved) identified and mapped in locally adopted HCP/NCCPs and their corresponding implementing ordinances. Allowable development and uses within ~~hardline preserves~~these preserves are

generally limited to activities considered compatible with conservation goals, such as passive recreation, scientific study, and essential public safety activities such as fuel management, law enforcement, and repair of infrastructure. Development of homes, businesses, and new or expanded infrastructure, and similar community elements are not allowed within ~~hardline preserve~~NCCP Preserve areas except where identified in the subregional plans. Softline preserves and minor, and major amendment areas are excluded from the analysis because these areas would be impact-neutral, meaning that loss of these areas would be compensated by adding lands of equal or higher habitat value into the ~~hardline preserve~~NCCP Preserve system consistent with the requirements of the respective NCCP and IA.

Any regional growth and land use change or transportation network improvement that encroaches into ~~hardline preserve~~NCCP Preserve areas would initially conflict with the HCP/NCCP and violate the NCCP permits; it is assumed that the majority of impacts on NCCP Preserves would be avoided. However, pursuant to adopted NCCP Subarea Plans and associated ordinances, procedures are in place to process preserve boundary line adjustments (e.g., City of San Diego 2018), or major or minor amendments to the NCCP Subarea Plans (e.g., County of San Diego 2010). Boundary adjustment or amendment approvals would require biologically equivalent or superior habitat compensation or project redesign when there is encroachment into ~~hardline preserve~~NCCP Preserve areas; major amendments also require approval by the regional offices of the USFWS and CDFW. There may be cases where a preserve boundary adjustment is not possible, and a project would be redesigned to avoid the preserve area as necessary. GIS data layers are used to identify existing ~~hardline preserve~~NCCP Preserve areas in the San Diego region. This database makes it possible to determine if any elements of the proposed Plan encroach into ~~hardline preserve~~NCCP Preserve areas that prohibit development, notwithstanding the possibility of a boundary adjustment that would compensate for impacts of encroachment, and to quantitatively assess the encroachment into ~~hardline preserves~~NCCP Preserves.

Some NCCP Preserves are already conserved while others are still in the planning stage. In order to avoid double-counting of overlay in areas where NCCP Preserves are already conserved, the impact acreage in the tables below for each horizon year is assigned to the "Conserved Lands and Habitat Preserves" category rather than in the respective NCCP Preserve layer. The overlay of already conserved areas on the NCCP Preserves is illustrated in Figure 4.4-16.

Furthermore, the analysis also includes potential encroachments into lands conserved outside the NCCP boundaries, including open space preserves or mitigation sites. Impacts on these conserved lands are highly unlikely due to the agreements that govern the conservation agreements that govern many if not most of these lands. The analysis is based on programmatic impact footprints; on a project-specific level, most of these impacts would likely be avoided through project redesign. The Public Park Preservation Act of 1971 (Public Resources Code Sections 5400-5409) requires that any "take" of public parkland may require compensation that is sufficient to acquire substantially equivalent substitute parkland or provide substitute parkland of comparable characteristics.

In addition, local policies and ordinances are qualitatively reviewed for potential conflicts with regional growth and land use change or transportation improvement projects.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Direct Impacts

Implementation of the regional growth and land use change in the proposed Plan through 2025 would encroach into existing South County MSCP ~~hardline preserves~~ Preserves, City of San Diego MHPA 100 percent preservation areas, City of Chula Vista MSCP Preserve (100 percent and 75 to 100 percent Conservation Areas), MHCP ~~FPA~~FPA/BCLA, and conserved lands and habitat preserves or mitigation areas that were set aside as implementation of the regional NCCPs (Table 4.4-16). The largest total area of encroachment is a result of development associated with Otay Mesa and Otay Ranch and potential impacts on the Otay Ranch Preserve. ~~In 2020, the County of San Diego applied for an amendment to the South County MSCP to include Otay Ranch (Village 14, Planning Areas 16 and 19), and to include the Quino checkerspot butterfly and San Diego fairy shrimp as covered species. The amendment would also include a land exchange to reclassify over 500 acres of hard line preserves. This land exchange is not addressed or analyzed in this EIR because the Wildlife Agencies have not yet approved the amendment. However, it is assumed that by the 2025 horizon year, the amendment would be approved.~~

Encroachment into the City's MHPA ~~100 percent preservation areas~~ consists of small fragments of urban development. Similarly, allowable development may occur in some portions of the MHCP FPA/BCLA depending on the classification of the impacted vegetation community. Larger impacts occur on the City of Chula Vista MSCP Preserve (100 percent and 75 percent Conservation Areas would result in impacts of 30 acres and 12 acres, respectively, during the 2025 horizon year) partially due to development at Otay Ranch; the latter will include an adjustment of the Otay Ranch Preserve boundary to be negotiated with the Wildlife Agencies. Impact acreages due to regional land use changes and specifically for spaced rural residential development overestimate impacts within ~~hardline preserves~~NCCP Preserves because development occurs at a much lower density in identified NCCP Preserves than other developed areas ~~and~~ as only portions of properties ~~are~~ would be developed. However, because any developed land use category for lands within ~~hardline preserve~~NCCP Preserves conflicts with the compatible land use designated for ~~hardline preserves~~NCCP Preserves, the entire acreage is quantified regardless of the percent conserved status.

Table 4.4-16
Forecasted Encroachments Into Conservation Areas and Lands Designated for Conservation by Regional Conservation Plans Within the San Diego Region (acres) up to the Year 2025

Conservation Categories	Regional Growth and Land Use Change	Transportation Network Improvements	Total
City of San Diego MHPA – 100 Percent Conserved	~~11.4~~60	4	~~14.4~~64
City of Chula Vista MSCP Preserve	42	2	44
~~MSCP South County~~MSCP Preserve South County ~~– Hardline Preserve~~	~~79.3~~58	~~29~~28	~~107.9~~86
MHCP – FPA/BCLA	~~49.8~~86	~~2~~3	~~51.7~~89
Conserved Lands and Habitat Preserves	~~137.5~~147	~~4~~7	~~141.5~~154

Indirect Impacts

Developments associated with regional growth and land use change planned for the 2025 horizon year are mostly located outside preserve systems, but some are immediately adjacent, which may cause impacts from edge effects, such as brush management conflicts, invasive species invasions, trespassing (including poaching and vandalism), unauthorized recreational uses, and roadkill.

Summary

By 2025, regional growth and land use change projected in the proposed Plan would allow for more development and redevelopment within ~~hardline preserve~~NCCP Preserve areas identified by adopted HCP/NCCPs or encroachment on already conserved open space. Project-specific planning, review by local agencies (including jurisdictions), regulatory agencies, and Wildlife Agencies, and CEQA review of land use and transportation projects would minimize or remove any potential conflict with policies and ordinances protecting biological resources. No other conflicts are expected with any approved local, regional, state, or federal regulations, policy, ordinance, or plan, with the exception of encroachment into ~~hardline preserve~~Preserve areas identified by adopted HCP/NCCPs.

If ~~hardline preserve~~NCCP Preserve areas are impacted by regional growth and land use, projects would be required to follow adopted HCP/NCCP procedures to process a preserve boundary adjustment if necessary. Full compensation of acreage and preserve function, retaining or improving upon the size, configuration, and habitat value of the preserve, would be required through coordination with USFWS, CDFW, and the appropriate local agency. Encroachment into conserved open space would likely require vacating any conservation easements, which is an unlikely process, and would require full compensation with open space conservation of equal or higher value; therefore, this analysis assumed that rather than vacating existing conservation easement, developments would be redesigned to avoid encroachments.

The majority of impacts on conserved lands would affect lands on Otay Ranch~~, which would be allowed under the County's amendment to the South County MSCP Subarea Plan once approved by the Wildlife Agencies. Because the amendment has not yet been approved, the reported acreage impacts do not reflect the amendment. As such, the impacts derived from the current data and reported in this EIR would be significantly overestimated upon amendment approval~~. Projects would follow adopted procedures to process a preserve boundary adjustment if necessary. In addition, all habitat-based mitigation would be required by the HCPs and/or NCCPs at ratios or quantities specified in the plans. Regional growth and land use change associated with the proposed Plan would be unlikely to violate policies and procedures of the adopted HCP/NCCPs, and ~~hardline preserve~~NCCP Preserve conflicts would be resolved through boundary adjustments, compensation, or project redesign so that impacts would be less than significant. In cases where a preserve boundary adjustment is not possible, due to unavailable habitat for mitigation, projects would be redesigned to avoid the preserve area because ~~hardline preserves~~NCCP Preserves are protected in perpetuity. Therefore, impacts of regional growth and land use change associated with the proposed Plan are less than significant.

Transportation Network Improvements and Programs

Direct and Indirect Impacts

Transportation network improvements would be the same as previously described in the 2025 analysis under Impact BIO-1, and are relatively minor; most of these impacts would be avoided as part of the project-specific design. Implementation of the transportation network improvements in the proposed Plan through 2025

would encroach into MHCP FPA/BCLA (Table 4.4-16), for example at Citracado Parkway II (including a bridge over Escondido Creek). The City of San Diego's MHPA would be encroached by the widening of Otay Lakes Road as it veers around the northern tip of the Upper Otay Lake.

Summary

By 2025, the transportation network improvements projected in the proposed Plan would impact ~~hardline preserve~~NCCP Preserve areas identified by adopted HCP/NCCPs. No other conflicts are expected with any approved local, regional, state, or federal regulations, policy, ordinance, or plan, with the exception of encroachment into ~~hardline preserve~~NCCP Preserve areas identified by adopted HCP/NCCPs. Project-specific review and approvals would eliminate the majority of these conflicts. In most cases, adopted circulation element roads are covered by the HCPs/NCCPs so that transportation network improvements would not be considered a conflict with the plan. As discussed above for regional growth and land use change, transportation network improvements associated with the proposed Plan would be unlikely to violate policies and procedures of the adopted HCP/NCCPs, and ~~hardline preserve~~NCCP Preserve conflicts would be resolved through boundary adjustments, compensation, or project redesign, so that impacts are less than significant.

2025 Conclusion

Implementation of regional growth and land use changes and transportation network improvements and programs associated with the proposed Plan would result in less-than-significant impacts related to encroachment into ~~hardline preserve~~NCCP Preserve areas identified by adopted HCP/NCCPs and conserved lands because biologically equivalent or superior habitat compensation f or project redesign would be required when there is encroachment into ~~hardline preserve~~NCCP Preserve areas. No other conflicts are expected with any approved local, regional, state, or federal regulations, policy, ordinance, or plan. Therefore, this impact (BIO-4) in the 2025 horizon year ~~2020~~ would be less than significant.

2035

Regional Growth and Land Use Change

By 2035, implementation of the ~~f~~ regional growth and land use changes in the proposed Plan would not encroach into existing South County MSCP ~~hardline preserves~~ Preserves. However, the City of San Diego MHPA 100 percent preservation areas, Chula Vista MSCP ~~hardline preserve~~ Preserve, and MHCP FPA would be affected (Table 4.4-17). Encroachment into preserved open space is significantly less than for the 2025 horizon year. The majority of encroachment is a result of spaced rural residential development within the City of San Diego ~~MSCP hardline preserve (~~MHPA~~)~~ and the MHCP ~~hairlines preserve (FPA~~FPA/BCLA ~~)~~ and conserved lands outside the NCCP boundaries. Impact acreages for spaced rural residential development overestimate impacts within ~~hardline preserves~~NCCP Preserves because development occurs at a much lower density than other developed areas and only portions of properties are developed, and impacts on ~~hardline preserves~~NCCP Preserves will likely be avoided consistent with land use policies. However, because any developed land use category for lands within ~~hardline preserve~~NCCP Preserve conflict with the compatible land use designated for ~~hardline preserves~~NCCP Preserves, the entire acreage is quantified. Encroachment into MHPA 100 percent preservation areas consists of small fragments of urban development. Such development as Fanita Ranch in Santee would occur based on a development-specific HCP that would include conservation and mitigation strategies.

Table 4.4-17
Forecasted Encroachments Into Conservation Areas and Lands Designated for Conservation by Regional Conservation Plans Within the San Diego Region (acres), 2026–2035

Conservation Categories	Regional Growth and Land Use Change	Transportation Network Improvements	Total
City of San Diego MHPA – 100 Percent Conserved	~~15.8~~47	~~79~~68	~~143.4~~115
City of Chula Vista MSCP Preserve	6	0	6
~~MSCP South County~~MSCP Preserve South County ~~– Hardline Preserve~~	0	95	~~115.8~~95
MHCP – ~~FPA~~FPA/BCLA	~~16.2~~39	~~7~~18	~~21.5~~57
Conserved Lands and Habitat Preserves	25~~.2~~	~~2~~14	~~27.2~~39

By 2035, the regional growth and land use change projected in the proposed Plan would allow for minor development and redevelopment within ~~hardline preserve~~NCCP Preserve areas identified by adopted HCP/NCCPs from regional growth with the exception of the South County MSCP. No other conflicts are expected with any approved local regional, state, or federal regulations, policy, ordinance, or plan, with the exception of encroachment into ~~hardline preserve areas~~NCCP Preserve areas identified by adopted HCP/NCCPs. The majority of impacts on conserved lands are a result of effects on lands within the Pardee Homes conserved lands, which would be allowed under the County's amendment to the South County MSCP Subarea Plan once approved by the Wildlife Agencies. Because the amendment has not yet been approved, the reported acreage impacts do not reflect the amendment. As such, the impacts derived from the current data and reported in this EIR would be significantly overestimated upon amendment approval. As discussed above for 2025, regional growth and land use change associated with the proposed Plan would be unlikely to violate policies and procedures of the adopted HCP/NCCPs, and ~~hardline preserve~~MSCP Preserve conflicts would be resolved through boundary adjustments, compensation, or project redesign, so that impacts are less than significant.

Transportation Network Improvements and Programs

Transportation network improvements would be the same as previously described in the 2035 analysis for Impact BIO-1. By 2035, more encroachment would occur from the transportation network improvements into the MHCP FPA/BCLA, County MSCP ~~hardline preserves~~Preserve, City of Chula Vista MSCP Preserve, and City of San Diego MHPA 100 percent preservation areas (Table 4.4-17). Specifically, managed lanes and Complete Corridor construction projects would occur across the FPA in the north County, including the SR 76 Complete Corridor project and associated local improvements, such as the widening of College Boulevard in the City of Oceanside. The SPRINTER double-tracking would also bisect or cross the MHCP FPA. The City of San Diego's MHPA would also be impacted by Complete Corridor projects, including the SR 52 (from I-15 to Mast Boulevard, and from Mast Boulevard to SR 125), the I-805 in the South County, and the SR 125 (from Jamacha Road to Amaya Drive). Rural Complete Corridor improvements would occur adjacent to the South County MSCP hardline at SR 94 at the intersection of Melody Road ad Daisy Drive.

By 2035, the transportation network improvements projected in the proposed Plan would impact ~~hardline preserve~~NCCP Preserve areas identified by adopted HCP/NCCPs. No other conflicts are expected with any

approved local, regional, state, or federal regulations, policy, ordinance, or plan, with the exception of encroachment into ~~hardline preserve areas~~NCCP Preserve areas identified by adopted HCP/NCCPs. As discussed above for 2025, transportation network improvements associated with the proposed Plan would be unlikely to violate policies and procedures of the adopted HCP/NCCPs, and ~~hardline preserve~~MSCP Preserve conflicts would be resolved through boundary adjustments, compensation, or project redesign so that impacts would be less than significant.

2035 Conclusion

Implementation of regional growth and land use changes and transportation network improvements and programs associated with the proposed Plan would result in less-than-significant impacts related to encroachment into ~~hardline preserve areas~~NCCP Preserve areas identified by adopted HCP/NCCPs because the proposed Plan would require biologically equivalent or superior habitat compensation or project redesign when there is encroachment into ~~hardline preserve areas~~NCCP Preserve areas. Project-specific planning, review by local agencies (including jurisdictions), regulatory agencies, and Wildlife Agencies, and CEQA review of land use and transportation projects would minimize or remove any potential conflict with policies and ordinances protecting biological resources. No other conflicts are expected with any approved local, regional, state, or federal regulations, policy, ordinance, or plan. Therefore, this impact (BIO-4) in the year 2035 would be less than significant.

2050

Regional Growth and Land Use Change

Regional growth and land use change by 2050 would be the same as previously described in the 2050 analysis for Impact BIO-1. By 2050 implementation of the regional growth and land use change in the proposed Plan would ~~only~~ encroach into the existing Chula Vista MSCP Preserve, mainly as a result of development in the Otay Ranch Preserve. The City of San Diego MHPA 100 percent preservation areas and the MHCP FPA/BCLA would not be significantly affected (Table 4.4-18). ~~Encroachment into preserved open space is significantly less than for the 2035 horizon year, with the majority of encroachment the result of spaced rural residential development within the City's MHCP.~~ Impact acreages for spaced rural residential development overestimate impacts within ~~hardline preserves~~NCCP Preserves because development occurs at a much lower density than other developed areas and only portions of properties are developed. However, because any developed land use category for lands within ~~hardline preserves~~NCCP Preserves conflict with the compatible land use designated for ~~hardline preserves~~NCCP Preserves, the entire acreage is quantified.

Table 4.4-18
Forecasted Encroachments Into Conservation Areas and Lands Designated for Conservation by Regional Conservation Plans Within the San Diego Region (acres), 2036–2050

Conservation Categories	Regional Growth and Land Use Change	Transportation Network Improvements	Total
City of San Diego MHPA – 100 Percent Conserved	~~1.5~~6	~~7~~688	~~93~~74.~~8~~
City of Chula Vista MSCP Preserve	58	8	66
~~MSCP South County~~MSCP Preserve South County~~ – Hardline Preserve~~	0	~~132~~117	~~138.5~~117
MHCP – ~~FPA~~FPA/BCLA	9~~0~~	~~8~~18	~~7.2~~27

Conservation Categories	Regional Growth and Land Use Change	Transportation Network Improvements	Total
Conserved Lands and Habitat Preserves	0~~.2~~	~~13~~44	~~13~~44~~.2~~

By 2050, the regional growth and land use change projected in the proposed Plan would allow for more development and redevelopment within ~~hardline preserve~~NCCP Preserve areas with the exception of County MSCP Preserves and conserved lands identified by adopted HCP/NCCPs. No other conflicts are expected with any approved local, regional, state, or federal regulations, policy, ordinance, or plan, with the exception of encroachment into ~~hardline preserve~~NCCP Preserve areas identified by adopted HCP/NCCPs. As discussed above for 2025 and 2035, regional growth and land use change associated with the proposed Plan would be unlikely to violate policies and procedures of the adopted HCP/NCCPs, and ~~hardline preserve~~MSCP Preserve conflicts would be resolved through boundary adjustments, compensation, or project redesign, so that impacts are less than significant.

Transportation Network Improvements and Programs

Transportation network improvements would be the same as previously described in the 2050 analysis for BIO-1. By 2050, implementation of the transportation network improvements in the proposed Plan would encroach into all existing ~~South County MSCP hardline preserves and the City of San Diego MHPA 100 percent preservation areas~~NCCP Preserves (Table 4.4-18). In addition to transportation network improvements described for 2025 and 2035, specific examples of transportation network improvements that encroach into ~~hardline preserves~~MSCP Preserves include the Complete Corridor projects, such as on I-15 across Santa Ana-Palomar through many portions of the PAMA; on SR 56 across and along the City's MHPA, Del Mar Mesa Open Space, Los Penasquitos Canyon Preserve and Rancho Penasquitos Open Space, and other conserved lands; and on SR 54 from Valley Road to SR 125, and on SR 125 from SR 905 to SR 54. In addition, the San Luis Rey River Trail to I-15 along San Luis Rey River would occur inside the FPA in Oceanside, along the City of San Diego's San Luis Rey River Park, and inside the PAMA.

By 2050, the transportation network improvements projected in the proposed Plan would impact ~~hardline preserve~~NCCP Preserve areas identified by adopted HCP/NCCPs. No other conflicts are expected with any approved local, regional, state, or federal regulations, policy, ordinance, or plan, with the exception of encroachment into ~~hardline preserve~~NCCP Preserve areas identified by adopted HCP/NCCPs.

As discussed above for 2025 and 2035, transportation network improvements associated with the proposed Plan would be unlikely to violate policies and procedures of the adopted HCP/NCCPs, and ~~hardline preserve~~NCCP Preserve conflicts would be resolved through boundary adjustments, compensation, or project redesign, so that impacts are less than significant.

2050 Conclusion

Implementation of regional growth and land use changes and transportation network improvements and programs associated with the proposed Plan would result in less-than-significant impacts related to encroachment into ~~hardline preserve~~NCCP Preserve areas identified by adopted HCP/NCCPs because the proposed Plan would require biologically equivalent or superior habitat compensation or project redesign when there is encroachment into ~~hardline preserve~~NCCP Preserve areas. Project-specific planning, review by local agencies (including jurisdictions), regulatory agencies, and Wildlife Agencies, and CEQA review of land

use and transportation projects would minimize or remove any potential conflict with policies and ordinances protecting biological resources. No other conflicts are expected with any approved local, regional, state, or federal regulations, policy, ordinance, or plan. Therefore, this impact (BIO-4) in the year 2050 would be less than significant.

Exacerbation of Climate Change Effects

Climate change would not cause direct conflicts with an HCP, NCCP, other conservation plan, or local biological protection policies or ordinances. Therefore, the proposed Plan would not exacerbate climate change effects on these conflicts.

4.5 CULTURAL RESOURCES

This section evaluates the cultural resources impacts of the proposed Plan.

4.5.1 EXISTING CONDITIONS

CULTURAL SETTING

Prehistoric Setting

The major cultural developments in the San Diego region before the arrival of Spanish colonists in 1769 are generally discussed within three major periods (Paleoindian, or Paleoamerican; Archaic; and Late Prehistoric), each marked by certain changes in the archaeological record. These archaeological changes appear to reflect a variety of shifts in technology, settlement, and land use.

Of the 109 federally recognized Indian tribes in California, 19 are located in the San Diego region. Additionally, the region is home to four Native American tribes that are not federally recognized. The tribal members of today's bands represent four Indian cultural/linguistic groups who have populated the region for more than 10,000 years, taking advantage of its abundant natural resources and diverse ecological system for their livelihoods. The four nations are the Kumeyaay, Luiseno, Cahuilla, and Cupeno, each of which is discussed in detail in Plan Appendix I.

Paleoamerican Period (12,000 to 7,000 Years Before Present [B.P.])

Despite decades of research, the early prehistory of coastal Southern California remains poorly understood. The archaeological record does reveal that humans had appeared by about 13,000 years ago on the Channel Islands, where they lived primarily by fishing and shellfishing. These early island components are of interest in that they seem to reflect fully developed maritime economies that were distinct from, but roughly contemporaneous with, the Clovis tradition represented throughout much of interior North America. Identified late Pleistocene components are lacking on the mainland coast of Southern California, although several sites have yielded calibrated dates in excess of 9,000 years (Erlandson et al. 2007:58–59). Archaeological complexes represented at these early sites include the San Dieguito complex with its finely worked scrapers and leaf-shaped and stemmed projectile points (Warren 1968, Warren et al. 1993), and the La Jolla complex represented by simple flaked cobble tools, relatively abundant groundstone, and flexed burials. Although the temporal and cultural relationship between San Dieguito and La Jolla continues to be debated, it is increasingly clear that human populations were well established along the coast of Southern California very early in the Holocene.

Archaic Period (7,000 to 1,500 B.P.)

Sea level rise was occurring since the last glacial maximum (about 18,000 years ago) and during the early Holocene sea levels increased. However, by around 8000 B.P., it appears that sea levels had begun to slow to a rate of about 0.25 meter per century, a process that allowed the formation of a complex mosaic of productive lagoon and estuary habitats at many locations along the region’s coastline (Masters and Aiello 2007, Masters and Gallegos 1997). These seem to have supported a significant coastal population during the early Archaic, as numerous coastal components have been found that date to this interval.

Archaeological remains in these components typically represent the La Jolla complex and often contain abundant shellfish and fish remains, along with flaked cobble tools, basin metates, manos, discoidals, stone

balls, and flexed burials. At the same time, it has been suggested that the contemporaneous inland Pauma complex may represent seasonal movements of early Archaic populations between coastal and inland resource areas (True and Pankey 1985, Warren et al. 1961). If so, a relatively broad seasonal range is implied for the early portion of the Archaic.

Although the basic toolkit represented by the La Jolla complex appears to have remained consistent throughout the Archaic, there are some indications of significant shifts in settlement. Compilations of radiocarbon assays for Batiquitos Lagoon (Gallegos 1985, Warren et al. 1961), for example, provide evidence for disuse of this location between about 3000 and 1500 B.P.

This and evidence from some other locations in the region led Warren (1964, 1968; Warren et al. 1961) and others (Gallegos 1985, Masters and Gallegos 1997) to postulate a population movement inland and southward in response to siltation and declining productivity of coastal lagoons in the northern portion of the region. More recent data, however, have demonstrated continued settlement and use of littoral resources throughout the late Archaic period in the region's northern areas (Byrd and Reddy 2002). It may be that, rather than widespread population movement away from the coast, the changing coastal ecology resulted in more localized settlement adjustments.

Late Prehistoric Period (1,500 B.P. to 1769)

In Southern California, the appearance of small, arrowhead-size projectile points and ceramics, and the practice of cremation around 1,300 years ago mark the beginning of the Late Prehistoric period. Projectile points commonly found in Late Prehistoric assemblages include Cottonwood Triangular and Desert Side-notched forms, both thought to mark the introduction of the bow and arrow into the region. Regional populations appear to have been relatively high during the Late Prehistoric, resulting in territorial restrictions, increased sedentism, and subsistence intensification. Villages were relatively stable and occupied for much of the year and were positioned for access to a variety of resource areas. Subsistence is thought to have focused on acorns and grass seeds, along with deer and a variety of small mammals. Along the coast, subsistence focused on the collection of shellfish and nearshore fishing.

Settlement patterns during the Late Prehistoric in the northern section of the San Diego region are not well understood, although the data do suggest some important spatial and temporal variation. The strongest settlement data come from the upper San Luis Rey River drainage system, where investigations by True and Waugh (1982) suggest a transition from a fairly wide-ranging mobility pattern during San Luis Rey I times into a territorially constricted pattern of seasonally bipolar movement between upland and lowland settlements. This interior-upland pattern is seen as distinct from that of the lower San Luis Rey River, where residential mobility is thought to have been even lower, with one principal village per group area.

Ethnographic Background

At Spanish contact, the northern portion of the San Diego region was occupied by speakers of a Takic language related to those dialects spoken in the Los Angeles Basin to the north but distinct from the Yuman language spoken to the south in San Diego. These groups were later known generally as the Juaneño and Luiseño, based on their associations with either Mission San Luis Rey or Mission San Juan Capistrano. The region occupied by the Luiseño and Juaneño extended along the coast roughly between Agua Hedionda to approximately Aliso Creek in present Orange County, and inland approximately to Palomar Mountain (Kroeber 1925, Oxendine 1983, Shipek 1977). The southern coastal portion of the San Diego region was occupied by the Kumeyaay, a Yuman-speaking group also known as the Kamia, Ipai, and Diegueño. Both the Luiseño/Juaneño and

Kumeyaay lived in semi-sedentary, politically autonomous villages that were typically positioned to provide access to a wide variety of resources.

The high population densities achieved by the Kumeyaay and Luiseño during the Late Prehistoric period led to the development of a number of intensive land use practices that are documented ethnographically. These included intensive use of a wide diversity of plant and animal foods as well as a number of land-management techniques that were designed to improve and maintain productivity, such as regular vegetation burning, plant husbandry, and erosion control and irrigation (Anderson 1993, Shipek 1993, White 1963).

HISTORIC SETTING

Spanish Period (1769–1821)

In July 1769, the first Spanish colonists arrived in San Diego. The mission and presidio, strategically located on a prominence overlooking the lower San Diego River valley and the northeastern corner of San Diego Bay, were completed the following year and represented the first permanent settlement by the Spanish in Alta California.

A small community of Hispanic settlers followed, establishing a pueblo about 5 miles north of San Diego's current downtown, in the area at the foot of Presidio Hill later known as Old Town (Engstrand and Brandes 1976, Pourade 1963). The pueblo and Presidio remained in the Old Town area even after the mission was moved to more favorable agricultural land in Mission Valley in 1774 (Pourade 1961). Under Spanish law, every pueblo was entitled to 4 square leagues of land. As a result, downtown San Diego was part of the original pueblo land of San Diego, which totaled over 48,000 acres. Most of this land remained undeveloped until the Anglo-American period (Mayer 1978, Pryde 1992).

Mission San Diego and San Luis Rey both followed a different policy than most California missions in that after baptism and training most neophytes were allowed to return to their villages. This, despite the considerable disruption imposed by the missions, allowed Native American groups to maintain many aspects of their traditional land use practices while still adapting to and integrating with the mission economic system (Shipek 1988). At the same time, many Kumeyaay maintained active resistance to the mission system (Carrico 2008, Luomala 1978, Miskwish 2007), and many interior portions of the San Diego region were only minimally influenced by the Spanish (Shipek 1988).

The land around the California missions and the first pueblos was gradually developed during the Spanish period, as new crops and animals were introduced. The padres and early settlers sought to reproduce the agricultural economy they knew in Spain in north-central Mexico and Alta California, thus creating the Mediterranean style and ambience still associated with the region (Dunmire 2004, Ford 2005, Mayer 1978). The California missions and presidios reflected the Spanish style in their architectural character and layout around courtyard gardens. The gradual introduction of European decorative plants and adaptation of native plants to the casas and courtyards eventually gave the area the Colonial appearance still linked in most people's minds with the region today. The Spanish settlers cultivated grapes for wine, olives, oranges, and lemons, and a variety of vegetables. They created small canal systems for the irrigation of crops; introduced cattle, sheep, and horses; and built in architectural styles derived from Spanish models (Ford 2005, Mayer 1978).

San Diego Bay was used as a port for the fur trade beginning in the early 1800s (Mayer 1978, Pourade 1961). The population of San Diego grew slowly during early 19th century. When the Mexican Revolution began in 1810, the population of the Presidio at San Diego was approximately 350 persons. By the time Mexico gained independence from Spain in 1821, the population of San Diego had risen to approximately 450 persons.

Mexican Period (1821–1846)

The end of Spanish customs regulations and the expansion of trade under Mexico opened California to the world. In 1823, the English firm of McCullough, Hartness, and Co. sent the vessel John Begg to San Diego and established a permanent mercantile house, the first foreign trading house in California. On August 17, 1833, the Mexican Congress passed the Secularization Act, which transferred mission-controlled land to private ownership. This act opened enormous tracts of new land to settlement, and immigration to San Diego began to increase. Concurrently, the mission system began to decline, forcing Native American occupants to seek alternative livelihoods (Carrico 1987, Luomala 1978).

In December 1834, San Diego was organized as a pueblo with the election of its first mayor, Juan Maria Osuna, and the Presidio was abandoned the following year. The main population center during the Spanish period had been the Mission San Diego de Alcalá, located well inland from the port. With enforced secularization, however, settlement around the mission was abandoned. In 1834, the first urban layout of the city, complete with a typical plaza mayor and substantial adobe buildings, arose near the Presidio in the area that later came to be known as Old Town. Large ranchos were established on the vast private land grants carved out of former mission lands. The new ranch owners were far more interested in mercantile commerce than had been the earlier Spanish padres, and actively sought ways to attract foreign, and especially American, traders. Tallow and hides were the main exports in this trade (Dana 1995). By the 1840s, merchants and brokers from the northeastern United States had become a common sight around San Diego Harbor (Ford 2005:8, Mayer 1978).

American Period (1846–Present)

The forces that led to the foundation of downtown San Diego began to become manifest after Alta California was ceded to the United States at the conclusion of the Mexican-American War. In the 50 some years that followed, the economic and political center of the city shifted from Old Town to the present downtown area, and the basic outlines of modern San Diego were established. The process was not straightforward or unilateral, but rather a process of fits and starts.

Old Town San Diego was occupied by U.S. forces during the Mexican-American War (1846–1848). The Treaty of Guadalupe-Hidalgo, which ended the war, ceded Alta California to the United States. The U.S. Boundary Commission Survey team arrived in San Diego in 1849 to survey the new border area. Boundary Commissioner John B. Weller assigned chief surveyor, Andrew B. Gray, to survey San Diego Bay and fix the beginning point of the survey (Scott 1976:21). The new international boundary line was located 1 marine league south of San Diego Bay.

The “port” at San Diego was little more than an off-loading beach, located in present-day Point Loma. Gray and his team camped near the Punto de los Muertos, an area settled by Spanish and Mexican residents 3 miles south of Old Town near the present-day Lindbergh Field, where access to the bay was easier. Gray quickly realized the potential for a new “American” seaport town at that site and switched his efforts toward establishing a “New Town” for San Diego (Newland 1992:30–35, Rolle 1956:90–91, Scott 1976:24–26). In January and February of 1850, Gray and Army Lt. Thomas Johns surveyed and mapped a 160-acre subdivision and port facility adjacent to the Punto de los Muertos.

Gray then attracted successful San Francisco merchant William Heath Davis and several prominent San Diegans, including José Antonio Aguirre, Miguel de Pedrorena, and William C. Ferrell, to help finance the purchase and development of the waterfront land where downtown San Diego now stands (Rolle 1956:91–92, Scott 1976:28).

This “New Town” consisted of the area bounded by present-day Broadway, Front Street, and the waterfront. Establishing New Town had its difficulties, and it was thwarted by the fact that San Diego went bankrupt. San Diego’s fortunes, however, were renewed after the end of the Civil War. By the late 1860s, there were plans for two subdivisions and talk of being the terminus for the transcontinental railroad. That did not come to fruition, but it did attract residents and established New Town for good.

There were periods of boom and bust in the years leading up to the turn of the century. With the dawn of the 20th century, business in San Diego again picked up and the city experienced reinvigorated growth. Between 1900 and 1920, San Diego’s population more than quadrupled from 17,700 to nearly 75,000 (Mills 1960:37, Pryde 1992:73). This growth was due in part to events such as commencement of construction on the Panama Canal; plans to build a railroad to Yuma, Arizona; the Panama-California Exposition of 1915–1916; and the U.S. Navy’s interest in making San Diego a major naval port. There were also significant populations developing in La Jolla, Ocean Beach, Mission Beach, and Point Loma. Smaller populations were in National City, Coronado, Oceanside, Encinitas, Julian, and Chula Vista (Pryde 1992:73). San Diego’s natural harbor also attracted immigrants interested in commercial fishing, and the fishing industry and its associated canneries helped to bolster the city's economy in the 1920s (Cleland et al. 1980). The expansion of the streetcar line in the 1920s began to alter patterns of development and residence. The streetcar allowed many families to move out to suburbs that were rapidly building up on the outskirts of town (Schaefer and Newland 1994).

San Diego suffered like every other city during the Great Depression, but the outbreak of World War II sparked an economic boom in most of the country, particularly in places like San Diego with an established military presence. The military took over large parts of San Diego, expanding existing bases and developing new ones. San Diego’s population stood at 203,341 in 1940; within a year it grew by 50,000 (Mayer 1978). The post-World War II era brought recovery in the form of an increased industrial base, a growing tourist business, and the commercial exploitation of rich agricultural lands. These resources, along with expansive military bases, have continued in importance to San Diego's economic well-being to the present day. The era also brought notable shifts in the local economy and residential patterns. The aerospace industry shifted from aircraft to missiles, and a post-war housing crunch led to a construction boom, which included post-war housing tracts in the suburbs served by massive new shopping centers and smaller shopping malls. More houses farther afield meant more cars, and by 1951 San Diego had four major freeway interchanges (McKeever 1994). The 1960s brought construction of a new sports stadium, expansion of the San Diego Zoo, and the formation of the San Diego Padres major league baseball team. Tourism became one of the leading industries and has remained so to this day.

The 1960s to the 1980s saw a significant increase in populations throughout the region, and cities like Del Mar, Poway, Santee, Vista, San Marcos, and Lemon Grove were established (Pryde 1992:77). Massive housing developments like Mira Mesa and Rancho Peñasquitos were built in the 1970s. Despite setbacks in recent years, the San Diego region has continued to grow and prosper.

The region today is home to 19 federally recognized tribal governments, the most in any county in the United States. Reservations have generally been established by Executive Order, and most of the land within the boundaries of reservations is owned by tribes and held in trust by the federal government. Native American reservations currently cover more than 116,000 acres, or approximately 4 percent of the region's land. Four tribal groupings make up the indigenous peoples of the San Diego region: the Kumeyaay/Diegueno, the Luiseno, the Cupeno, and the Cahuilla (see Plan Appendix I). Tribal economic development has had an influence on the region’s overall development. This is mostly due to casinos (e.g., Barona, Campo, Sycuan, Viejas), which are mainly responsible for creating 10,000 jobs, a $1 billion industry, $263 million in goods and services, and

$500 million in payroll. The tribes without gaming facilities continue to have economic development, transportation, and infrastructure needs (Plan Appendix I).

EXISTING CULTURAL RESOURCES

Cultural resources include historic period buildings, structures, districts, and objects; archaeological sites and districts dating from either prehistoric, ethnographic, or historic times; and tribal cultural resources of importance to local Native American tribes (sites, features, places, cultural landscapes, sacred places, and objects of cultural value). Numerous cultural resources have been documented in the San Diego region, and some areas of the region have not yet been inventoried. The following information provides a context for the types of cultural resources in the region and a general discussion of the range of known cultural resources that may be present.

In California, cultural resources are recorded in the California Historical Resources Information System (CHRIS), which consists of the California State Office of Historic Preservation (OHP), nine Information Centers, and the State Historical Resources Commission. The Information Centers are spread across California and are the repositories for recorded historical resources within their region. In San Diego, the South Coastal Information Center (SCIC) holds the records for historical resources recorded in the region. According to the SCIC, as of August 8, 2018, there are 37,567 cultural resources (including 13,500 isolated finds) in the San Diego region recorded in CHRIS (J. Lennox, pers. comm. 2018). This information is collected by the SCIC when requested.

Archaeological Resources: Historic and Prehistoric

Specific information on the location and description of archaeological resources is generally kept confidential to lessen the potential for vandalism and theft by looters. The specific regulations that provide for this are discussed in Section 4.5.2, *Regulatory Setting*.

Historic archaeological site types that have been encountered in the San Diego region vary according to the time period and activity with which they are associated. They can contain surface material or be buried. Early period, Spanish period, and Mexican period sites include adobe homesteads and presidio and mission-related sites. These include the San Diego Presidio, Mission Dam, the San Diego Mission, and the San Luis Rey Mission. Most of the known sites have undergone data recovery and it would be rare to find any new sites.

In the early American Period up until about 1920, most archaeological sites in an urban environment consist of garbage dumps in wells, cisterns, or trash pits. Building foundations are also common during this period, as are industrial features. The majority of sites already identified from this time period exist in developed areas of San Diego. In the San Diego mountains, mining sites are more prevalent. After the 1920s, the establishment of town dumps and sewer and water systems meant that trash-related archaeological features were less common. Materials commonly found at historic sites include ceramics, glass, metal, and animal bone.

Leather, wood, and cloth do not generally preserve well and are not commonly found in historic sites. Some site types, such as military and farming/ranching complexes, are found throughout the San Diego region and from any time period. Historic buildings and structures are also present throughout the San Diego region and can be found in association with archaeological sites or on their own.

Prehistoric sites tend to fall into distinctive categories that relate to the activities that took place. They are found throughout the region, but tend to be more common in areas close to a water source or resources (such as materials for tool making or readily available food), and on flatter ground. Like historic sites, they can be

found on the surface, or buried. Due to the propensity for settling close to water sources, prehistoric sites that were originally just surficial can be buried over time by alluvial action. The site types and the materials associated with them are summarized below.

- **Habitation sites.** These are seasonal or semi-permanent. Activities at these sites include food preparation, milling, cooking, tool production, ceramic production, leather working, basket weaving, construction, and ritual activities.
- **Temporary camps.** A range of activities took place at these camps. This could include any of the activities performed at a habitation site, but at a temporary camp there would have been a shorter activity period, so less material evidence would be left.
- **Artifact scatter.** An artifact scatter consists of ceramics, flaked stone, or ground stone that is not accompanied by subsurface deposits. Some animal bone or shell may also occur. An artifact scatter could represent a temporary place to stop or somewhere to process a resource from the surrounding area.
- **Lithic scatter.** This is a low-density scatter of lithic material used in tool production. Typically, it is the discard from the process that is left behind, not the actual tools.
- **Bedrock milling.** These are areas of bedrock used to process food such as acorns or seeds. This was done with a pestle (which crushes the food) or mano (which grinds the food).
- **Quarry.** A quarry is where raw stone material was extracted for tool making. These sites were visited only briefly.
- **Shell midden.** This can be an area where shellfish was processed, or it can be associated with a habitation site or temporary camp.
- **Rock art.** This includes petroglyphs (patterns etched into rocks) and pictographs (patterns "painted" on rocks) that are often associated with ritual.

Major coastal villages were known to have existed along the estuaries and lagoons along the San Diego coastline and up the corresponding rivers, such as the village of Kosti or Cosoy near the mouth of the San Diego River (Kroeber 1925) and Ystagua in the Sorrento Valley area. While many historic and prehistoric resources have been identified and documented within the San Diego region, many unidentified resources remain unevaluated. In addition, the exact locations of some of the known sites (such as Cosoy) are yet to be confirmed. Some areas within the San Diego region have a particularly high potential for prehistoric and historic cultural resources.

For example, lagoons and rivers were areas of high traffic and settlement during prehistoric times due, in part, to the abundance of water, food, and other resources, while coastal communities were some of the earliest and heaviest areas of settlement during historic times due to their access to both resources and transportation.

Historic Districts, Registers, and Landmarks

In addition to the thousands of archaeological sites recorded within the San Diego region on the California Historic Resources Inventory, there are numerous historical resources (buildings, sites, structures, objects, or districts) listed on federal, State, and local registers, such as the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks, and County of San Diego Historical Landmarks. For San Diego County, cultural resources information from these inventories and registers are obtained from the South Coastal Information Center, which is part of the California Historical Resources Information System and housed at San Diego State University. Other historic inventories have been prepared by various cities within the San Diego region. Approximately 9,500 historical structures are recorded in the San Diego region (Lennox, pers. comm. August 8, 2018). Some of these are part of larger districts.

The following is a description of the types of other listings that exist in the San Diego region for archaeological and historic architectural resources. These descriptions are adapted from the State of California OHP (2018).

- California Historical Landmarks are buildings, sites, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other historical value.
- California Points of Historical Interest are buildings, sites, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other historical value.
- The California Register of Historical Resources includes buildings, sites, structures, objects and districts significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.
- The National Register of Historic Places includes buildings, structures, objects, sites, and districts of local, state, or national significance in American history, architecture, archeology, engineering, and culture.

There are 18 historic districts listed in the NRHP within the San Diego region (see Table 4.5-1). This number does not represent those that may be in the process of being listed. Many of the districts are located in more urban areas, specifically in and around the city of San Diego. These include such historical districts as Cabrillo National Monument, Balboa Park, and the Gaslamp Quarter Historic District.

Table 4.5-1
Nationally Designated Historic Districts in the San Diego Region

Historic District	Location
Balboa Park	California Quadrangle 41, San Diego
Cabrillo National Monument	Near southern tip of Point Loma
El Prado Complex	Balboa Park, San Diego
Fages-De Anza Trail-Southern Emigrant Road	Anza-Borrego State Park
Gaslamp Quarter Historic District	Bounded by railroad tracks, Broadway, 4th, and 6th Streets, San Diego
Heilman Villas	Orange Avenue, Coronado
Kuchamaa	Southeast of San Diego at the U.S.-Mexican Border
Marine Corps Recruit Depot Historic District	South of junction of Barnett Avenue and Pacific Highway, San Diego
Naval Air Station, San Diego, Historic District	Naval Air Station, North Island, North Shore, San Diego
Naval Training Station	Barnett Street and Rosecrans Boulevard, San Diego
Old Town San Diego Historic District	Junction of Interstate (I-) 5 and I-8, San Diego
Rancho De Los Kiotes	6200 Flying L.C. Lane, Carlsbad
Rockwell Field	North Island, San Diego
Rosicrucian Fellowship Temple	2222 Mission Avenue, Oceanside
San Diego Civic Center	1600 Pacific Highway, San Diego
San Diego State College	5300 Campanile Drive, San Diego
Table Mountain District	Jacumba, Unincorporated County of San Diego
University Heights Water Storage and Pumping Station Historic District	4236 Idaho Street

Source: NRHP 2017a.

In addition to the NRHP historic districts, 130 individual historical resources in the San Diego region are listed in the NRHP (NRHP 2017a). There are also 17 National Historic Landmarks (NRHP 2017b). Resources listed in the NRHP are automatically listed in the CRHR. Most of these resources within the San Diego region are buildings or structures, such as the Hotel Del Coronado and the Point Loma Lighthouse; however, some archaeological sites are on the list. The State of California Historical Resources Commission has designed the CRHR program in order to identify, evaluate, register, and protect California's historical resources. There are also 72 California State Historical Landmarks in the San Diego region (California OHP 2018).

At the local level, a number of jurisdictions inventory the resources that are present to develop management plans and standards for their protection. This has become more often the case as urban areas are limited in their choices of undeveloped land and instead move toward adaptive reuse of existing buildings and features of the built environment. For example, the City of San Diego Historical Resources Board works to evaluate and preserve resources and has designated over 950 resources of local concern (City of San Diego Historical Resources Board 2018). Several of these resources are also listed in the NRHP either individually or as part of a district. In addition, the County of San Diego and the Cities of Oceanside, Poway, Escondido, Carlsbad, Encinitas, National City, Chula Vista, La Mesa, and El Cajon also maintain historic resource inventories.

Ethnographic Resources and Sacred Sites

Ethnographic resources include sites, areas, and materials important to Native Americans for religious, spiritual, or traditional uses. These can encompass the sacred character of physical locations (mountain peaks, springs, and burial sites) or particular native plants, animals, or minerals that are gathered for use in traditional ritual activities. Villages, burials, rock art, rock features, and traditional hunting, gathering, or fishing sites may also constitute significant Native American cultural resources. Such resources may be eligible for listing in the NRHP as Traditional Cultural Properties and may be included in the California Sacred Lands File maintained by the California Native American Heritage Commission (NAHC). For specific development or transportation projects, the NAHC would provide information to qualified persons conducting cultural resources studies. Although the NAHC does not provide the location of the resources, they would provide a list of Native American tribes that have a traditional and cultural affiliation with the geographic area of the proposed project (PRC 21080.3.1) who can be contacted. Tribal consultation with these tribes is typically done during the AB 52 (Chapter 532, Statutes of 2014) consultation process.

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

Climate change may threaten cultural resources due to sea-level rise submerging coastal lands, more frequent and severe flooding, higher temperatures, and higher incidence of wildfire. The San Diego region is likely to experience sea level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season. More details on future climate projections are available in Appendix C.

Sea-level rise presents a risk to cultural resources within the San Diego region, although the extent to which this will damage cultural resources is not known. According to a study by Lipps and Pedersen (2015), 4.6 feet of sea-level rise could affect 194 Native American cultural sites in Southern California. Additionally, historic districts could experience more frequent or severe flooding impacts due to sea-level rise; for example, the Cabrillo National Monument could be vulnerable to sea-level rise and increased storm frequency and intensity, although the extent of this risk is not fully understood (Smith 2018).

Changes in temperature and precipitation could also damage cultural resources, although the extent to which these could negatively affect archaeological and cultural resources in the San Diego region has not been quantified. Higher temperatures can cause faster rates of deterioration due to thermal stress and biological activity, more rapid decay of organic materials, heat stress on culturally significant vegetation, and loss of culturally significant habitat and species due to disease and temperature changes (Rockman et al. 2016). Heavy precipitation and flooding could damage cultural resources due to site erosion and destabilization, direct physical damage to the site, loss of artifacts due to flooding, and increased risk of post-flood subsidence (Rockman et al. 2016).

Cultural resources in the San Diego region may also be threatened due to more intense or frequent wildfires as observed from past events. In 2002, the Pines Fire covered nearly 100 square miles in San Diego County. In the process of recovery, archaeologists identified 249 cultural sites within or immediately adjacent to the fire, and another 50 within the area of bulldozer activity, including rock shelters, Native American settlements, and rock art (Waechter 2012). Wildfires can increase damage to archaeologically relevant structures, alter the artifacts exposed to extreme heat, increase susceptibility to erosion and flooding, and exacerbate damages due to firefighting activities (Rockman et al. 2016). Wildfire could also damage historical structures or alter their distinct physical characteristics as older buildings may not have as robust defenses against wildfire as modern buildings (Rockman et al. 2016).

It is possible that sea-level rise, flooding, wildfire, and landslides could reveal or damage human remains. Remains exposed to the environment from climate hazards may then be further damaged by extreme weather; for example, changes in temperature and precipitation could speed deterioration and decay, cause thermal stress, and cause erosion (Rockman et al. 2016).

4.5.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Historic Sites, Building, Objects, and Antiquities Act

The Historic Sites, Building, Objects and Antiquities Act (16 United States Code [USC] 461–462, 464–467) was passed in 1935 to preserve American sites, buildings, objects, and antiquities of national significance for public use. This Act created the position of Secretary of the Interior and established an advisory board, members of which are appointed by the Secretary, to aid him or her in implementing the Act. Powers of this Act can be executed by the National Parks Service on both federal and nonfederal Lands. Relying on authority provided by this Act, the National Natural Landmarks (NNL) Program was established in 1962 to recognize and encourage the conservation of outstanding examples of the country's natural history. NNLs are designated by the Secretary of the Interior, with the owner's concurrence, as being of national significance, defined as being one of the best examples of a biological community or geological feature within a natural region of the United States.

National Historic Landmarks Program

The National Historic Landmarks Program, developed in 1982, identifies and designates National Historic Landmarks and encourages the long-range preservation of nationally significant properties that illustrate or commemorate the history and prehistory of the United States. This program sets forth the criteria for establishing national significance and the procedures used by the Department of the Interior for conducting the National Historic Landmarks Program.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) (42 USC 4321 et seq.) directs federal agencies to use all practicable means to "preserve important historic, cultural, and natural aspects of our national heritage" (Section 101[b] [4]). Regulations for implementing NEPA are found in 40 Code of Federal Regulations (CFR) Parts 1500–1508. Consideration of cultural resources is required under NEPA for proposed federal actions.

National Historic Preservation Act

The National Historic Preservation Act (NHPA) (16 USC 470–470b, 470c–470n) was passed in 1966 and set the foundation for much of the more specific legislation that guides cultural resource protection and management in local jurisdictions. The law outlines the responsibilities of federal agencies and specifies guidelines that must be followed when assessing the effects of a project on a historic site. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council a reasonable opportunity to comment on such undertakings. The goal of the Section 106 process is to identify historic properties potentially affected by the undertaking; assess its effects; and seek ways to avoid, minimize, or mitigate any significant impacts related to historic properties.

National Register of Historic Places

The NRHP is a list of federally recognized historic sites, buildings, and structures that are to be preserved, as they are significant to the history of their community, state, or the country. Established by the NHPA and developed in 1981, the NRHP is an authoritative guide to be used by federal, state, and local governments; private groups; and citizens to identify the nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment. Sites listed in the NRHP must be considered in the planning of all federal, federally licensed, and federally assisted projects. Listing of private property in the NRHP does not prohibit under federal law or regulation any actions that may otherwise be taken by the property owner with respect to the property.

Eligibility for the NRHP rests on two factors: significance and integrity (National Park Service 1997). In order to be eligible for inclusion in the NRHP, a property must meet one or more of the significance criteria listed below and retain integrity.

- **Criterion A**—Association with "events that have made a significant contribution to the broad patterns of our history."
- **Criterion B**—Association with "the lives of persons significant in our past."
- **Criterion C**—Resources "that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction."
- **Criterion D**—Resources "that have yielded, or may be likely to yield, information important to history or prehistory."

In addition to significance, the NRHP recognizes a property's integrity through seven aspects or qualities: location, design, setting, materials, workmanship, feeling, and association.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001 et seq.) was passed in 1990 and establishes the rights of Native American lineal descendants for ownership and control of Native

American human remains and cultural objects. NAGPRA requires that an inventory of Native American human remains and funerary objects must be compiled by federal funded agencies and all museums and educational institutions receiving federal funds. Additionally, NAGPRA makes it illegal to traffic in Native American remains and cultural items without the right of possession, whether or not they derive from federal or Native American lands.

The second major purpose of NAGPRA is to provide greater protection for Native American burial sites and more careful control over the removal of Native American human remains, funerary objects, sacred objects, and items of cultural patrimony on federal and tribal lands. All Indian tribes or Native Hawaiian organizations must be consulted whenever archaeological investigations encounter, or are expected to encounter, Native American cultural items or when such items are unexpectedly discovered on federal or tribal lands. Excavation or removal of any such items also must be done under procedures required by the Archaeological Resources Protection Act (Section 3 (c)(1)).

Archaeological Resources Protection Act of 1979

The Archaeological Resources Protection Act (16 USC 470aa–47011) was passed in October of 1979 to increase the protection of unique archaeological resources on public and Indian lands. Section 9 of this act provides for the confidentiality of archaeological resource and their locations. This prevents looting and destruction of these resources.

The Department of Transportation Act

Passed in 1966, the Department of Transportation Act (49 USC 303, formerly 49 USC 1651(b)(2) and 49 USC 1653f) includes Section 4(f), which states that the Federal Highway Administration and other United States Department of Transportation agencies cannot approve the "use" of land from certain properties, including public and private historical sites, unless certain conditions apply. These exceptions are the following: "If there is no feasible and prudent avoidance alternative to the use of land, and if the action includes all possible planning to minimize harm to the property resulting from such use; or if The Administration determines that the use of the property will have a *de minimis* impact."

The Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation

These standards and guidelines, effective as of 1983, are prepared under the authority of Section 101(f)(g)(h) and Section 110 of the NHPA of 1966, as amended. These standards and guidelines are not regulatory and do not set or interpret agency policy. They provide technical advice for archaeological and historic preservation practices. Their purpose is (1) to organize the information gathered about preservation activities; (2) to describe results to be achieved by federal agencies, states, and others when planning for the identification, evaluation, registration, and treatment of historic properties; and (3) to integrate the diverse efforts of many entities performing historic preservation into a systematic effort to preserve the nation's culture heritage (48 *Federal Register* 44716).

The Secretary of the Interior's Standards for Rehabilitation

These standards were established by the Secretary of the Interior in 1986 as a way to homogenize rehabilitation efforts of nationally significant historic properties and buildings. These standards pertain to actions involved in returning a property to a state of utility through repair or alteration. This allows for the preservation of historic and cultural values of the property, while giving it an efficient contemporary use (36 CFR 67).

The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings

The Standards for the Treatment of Historic Properties is a compilation of 34 guidelines to promote the responsible preservation of U.S. historic cultural resources. The standards specifically address preservation, rehabilitation, restoration, and reconstruction of historic materials. The standards are not intended to be the sole basis for decision making in regard to whether a historic property should be saved, but to provide consistency in conservation and restoration practices (36 CFR 68).

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

California Office of Historic Preservation

The OHP is responsible for administering federally and State-mandated historic preservation programs to protect California's historic and archaeological resources. The OHP is guided by the State Historic Preservation Officer and the State Historical Resources Commission. The OHP is responsible for (1) Identifying, evaluating, and registering historic properties; (2) ensuring compliance with federal and State regulations; (3) encouraging adoption of economic incentive programs designed to benefit property owners; and (4) encouraging economic revitalization by promoting historic preservation through education and public awareness, and by demonstrating leadership and stewardship for historic preservation in California.

California Historical Landmarks Program

The Historical Landmarks Program was instated to register buildings or landmarks of historical interest. Historical Landmarks are defined as sites, buildings, or features that have a statewide historical, cultural, anthropological, or other significance. To be designated as a Historical Landmark by the Director of California State Parks, the resource must meet set criteria, be recommended for designation by the State Historical Resources Commission, and be approved by the property owners. The goals of the program include the preservation and maintenance of registered landmarks, most of which include missions, early settlements, battles, and gold rush sites (Public Resources Code [PRC] Sections 5020.4, 5021, 5022, 5022.5, 5031, and 5032).

California Points of Historical Interest Program

Points of Historical Interest are sites, buildings, or features that are of local historical, cultural, or anthropogenic significance. The California Points of Historical Interest Program was established in the effort to accommodate local historic properties unable to meet the restrictive criteria of the California Historical Landmarks Program, so that they may still be given limited protection in regard to development. The Points of Historical Interest Program requires the participation of local governmental officials in the approval process (PRC Sections 5020.4, 5021, 5022, 5022.5, 5031, and 5032).

California Register of Historical Resources

The CRHR program was designed for use by State and local agencies, private groups, and citizens to identify, evaluate, register, and protect California's historical resources. A historical resource can include any object, building, structure, site, area, or place that is determined to be historically or archaeologically significant. The CRHR is an authoritative guide to the state's significant archaeological and historic architectural resources. The list of these resources can be used for State and local planning purposes, the eligibility determinations can be used for State historic preservation grant funding and listing in the CRHR provides a certain measure of protection under CEQA.

The process for identifying historical resources is typically accomplished by applying the criteria for listing in the CRHR per 14 CCR Section 4852, which states that a historical resource must be significant at the local, State, or national level under one or more of the following four criteria:

- **Criterion 1—**It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- **Criterion 2—**It is associated with the lives of persons important in our past.
- **Criterion 3—**It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values.
- **Criterion 4—**It has yielded, or may be likely to yield, information important in prehistory or history.

To be considered a historical resource eligible for listing in the CRHR, the resource must also have integrity, which is the authenticity of a resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance.

Resources, therefore, must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. It must also be judged with reference to the particular criteria under which a resource is eligible for listing in the CRHR per 14 CCR Section 4852(c).

California Environmental Quality Act

CEQA applies to all discretionary projects undertaken or subject to approval by public agencies (CEQA Guidelines Section 15002[i]). CEQA (PRC Section 21001[b], [c]) states that it is the policy of the State of California to "take all action necessary to provide the people of this state with… historic environmental qualities…and preserve for future generations examples of the major periods of California history." CEQA Guidelines require that historical resources and unique archaeological resources be taken into account during the environmental review process.

CEQA Guidelines Regarding Historical Resources

The CEQA Guidelines (Section 15064.5[a]) define a *historical resource* as including the following:

- A resource listed in, or eligible for listing in, the California Register of Historical Resources;
- A resource listed in a local register of historical resources (as defined at PRC Section 5020.1[k]);
- A resource identified as significant in a historical resources survey meeting the requirements of PRC Section 5024.1(g); or
- Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. (Generally, a resource is considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the CRHR; see discussion of the CRHR above.)

A project that causes a "substantial adverse change" in the significance of a historical resource may have a significant effect on the environment (CEQA Guidelines Section 15064.5[b]). The CEQA Guidelines (Section 15064.5[b][1]) define "substantial adverse change" as "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." Generally, the significance of a historical resource is "materially impaired" when

a project demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its inclusion in or eligibility for the CRHR, or its inclusion in a local register of historical resources (CEQA Guidelines Section 15064.5[b][2]). Mitigation measures are discussed in Section 21084.1 as well as Section 15126.4. Generally, by following the Secretary of the Interior's Standards for the Treatment of Historic Properties or the Secretary of the Interior's Standards for Rehabilitation, impacts can be considered as mitigated to a level less than significant (CEQA Section 15064.5 [b]).

CEQA Guidelines Regarding Archaeological Resources

If the cultural resource in question is an archaeological site, the CEQA Guidelines (Section 15064.5[c][1]) require that the lead agency first determine if the site is a historical resource as defined in Section 15064.5(a). If the archaeological site qualifies as a historical resource, potential adverse impacts must be considered in the same manner as a historical resource (CEQA Guidelines Section 15064.5[c][2]). If the archaeological site does not qualify as a historical resource but does qualify as a unique archaeological resource, then the archaeological site is treated in accordance with PRC Section 21083.2 (CEQA Guidelines Section 15064.5[c][3]). In practice, most archaeological sites that meet the definition of a unique archaeological resource also meet the definition of a historical resource.

CEQA (PRC Section 21083.2[g]) defines a *unique archaeological resource* as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it:

- Contains information needed to answer important scientific research questions, and there is public information in that information.
- Has a special and particular quality, such as being the oldest or best example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

CEQA Guidelines Sections 15064.5(d) and (e)

CEQA Guidelines Sections 15064.5(d) and (e) assign special importance to human remains and specify procedures to be used when Native American remains are discovered. These procedures are detailed further in PRC Section 5097.98 and Health and Safety Code Section 7050.5.

Public Resources Code Sections 5097.5, 622.5, and 5097.9

PRC Section 5097.5 states that a person "shall not knowingly excavate, harm, or destroy any historic or prehistoric ruins or sites on public lands, unless granted permission by the public agency that has jurisdiction over those lands." It goes on to state that if this section is violated, the action is classified as a misdemeanor, punishable by fine and/or imprisonment. The section outlines the specific parameters of addressing the violation. PRC Section 622.5 establishes that any person, who is not the owner thereof, who willfully injures, disfigures, defaces, or destroys an object of archaeological or historical value on private or public lands is guilty of a misdemeanor.

PRC Section 5097.9 requires consultation with the California NAHC whenever Native American graves are found. Pursuant to Health and Safety Code subdivision c of Section 7050.5 (see below), when the NAHC is notified of human remains, it shall immediately notify those persons it believes to be the Most Likely Descendants (MLDs). Section 5097.98 1(b) states: "[u]pon the discovery of the Native American remains, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological

standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the landowner has discussed and conferred, as prescribed in this section, with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains. The landowner shall discuss and confer with the descendants all reasonable options regarding the descendants' preferences for treatment." It also states possible preferences the MLD may have for said treatment, including preservation in place, nondestructive removal and analysis, relinquishment to the MLD, or other appropriate treatment. Conferral or discussion between the MLD and landowner is described in Section 5097.98 2(c) as "meaningful and timely discussion and careful consideration of the views of each party, in a manner that is cognizant of all parties' cultural values, and where feasible, seeking agreement."

Health and Safety Code Section 7050.5 – Human Remains

Health and Safety Code (HSC) Section 7050.5 requires that in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site, or any nearby area reasonably suspected to overlay adjacent remains, until the County Coroner has examined the remains. If the Coroner determines, or has reason to believe, the remains to be those of a Native American, the Coroner shall contact the NAHC by telephone within 24 hours. In addition, any person who mutilates or disinters, wantonly disturbs, or willfully removes any human remains in or from any location other than a dedicated cemetery without authority of law is guilty of a misdemeanor.

Health and Safety Code Sections 18950–18961 – State Historical Building Code

HSC Sections 18950 through 18961 provide alternative building regulations and building standards for the rehabilitation, preservation, restoration (including related reconstruction), or relocation of buildings or structures designated as historic buildings. Such alternative building standards and building regulations are intended to facilitate the restoration or change of occupancy so as to preserve their original or restored architectural elements and features, to encourage energy conservation and a cost-effective approach to preservation, and to provide for the safety of the building occupants.

Tribal Consultation Guidelines

Senate Bill (SB) 18 of 2004 (Chapter 905, Statutes of 2002) provides for the protection of Native American cultural lands and places by requiring cities and counties to consult with California Native American Tribes prior to adopting or amending a general plan or specific plan. In 2005, the Governor's Office of Planning and Research (OPR) released the Tribal Consultation Guidelines (California OPR 2005) as a supplement to the General Plan Guidelines to aid cities and counties in implementing the provisions of SB 18.

Assembly Bill 52

Assembly Bill (AB) 52 (Chapter 532, Statutes of 2014) was passed on September 25, 2014, and applies to all projects that file a notice of preparation or notice of negative declaration or mitigated negative declaration on or after July 1, 2015. The bill requires that a lead agency notify and begin consultation with a California Native American tribe if that tribe has requested, in writing, to be kept informed of proposed projects by the lead agency and has then requested consultation for a particular project, prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report. The bill also specifies mitigation measures that may be considered to avoid or minimize impacts on tribal cultural resources. See additional discussion of AB 52 in Chapter 4.17, *Tribal Cultural Resources*, of this EIR.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

County of San Diego Code of Regulatory Ordinances Sections 86.601–86.608, Resource Protection Ordinance

This ordinance requires that cultural resources be evaluated as part of the County's discretionary environmental review process and if any resources are determined significant under the Resource Protection Ordinance (RPO), they must be preserved. RPO prohibits development, trenching, grading, clearing, and grubbing, or any other activity or use damaging to significant prehistoric or historic site lands, except for scientific investigations with an approved research design prepared by an archaeologist certified by the Register of Professional Archaeologists. Sites determined to be RPO significant must be avoided and preserved.

San Diego County Local Register of Historical Resources (San Diego County Administrative Code Section 396.7)

The County of San Diego maintains a Local Register that was modeled after the CRHR (San Diego County Administrative Code Section 396.7). The purpose of the San Diego County Local Register of Historical Resources (Local Register) is to develop and maintain "an authoritative guide to be used by state agencies, private groups, and citizens to identify the County's historical resources and to indicate which properties are to be protected, to the extent prudent and feasible, from substantial adverse change." Sites, places, or objects that are eligible to the NRHP or the CRHR are automatically included in the Local Register. Resources may also be listed if they meet set criteria specified in Section 396.7 of the San Diego County Administrative Code.

Local Jurisdictions' Preservation Policies and Regulations

Every local government in California has the authority to adopt local ordinances that pertain to historic and archaeological resources. These ordinances outline statements of goals, policies and actions that encourage the designation, preservation and protection of existing historical and cultural resources, and foster public awareness and appreciation of a community's cultural resources. The County of San Diego and many cities in the County have cultural resources preservation ordinances, which are listed below in Table 4.5-2.

Table 4.5-2
City and County Cultural Resources Preservation Ordinances

Jurisdiction	Local Government Regulations
City of Carlsbad	Municipal Code, Title 22
City of Chula Vista	Municipal Code, Title 21
City of Coronado	Municipal Code, Title 84
City of Del Mar	Municipal Code, Chapter 30.58
City of El Cajon	Municipal Code, Chapter 17.55
City of Encinitas	Municipal Code, Chapter 30.34.050
City of Escondido	Municipal Code, Chapter 33, Article 40
City of Imperial Beach	None
City of La Mesa	Municipal Code, Title 25
City of Lemon Grove	None
City of National City	Code of Ordinances, Chapter 15.34, Chapter 18.12
City of Oceanside	Code of Ordinances, Chapter 14A
City of Poway	Municipal Code, Chapter 17.45

Jurisdiction	Local Government Regulations
City of San Diego	Municipal Code, Chapter 14, Article 3, Division 2
City of San Marcos	None
City of Santee	Municipal Code, Chapter 15.60
City of Solana Beach	Municipal Code, Title 17.60.160
City of Vista	Municipal Development Code, Chapter 15.12
County of San Diego	County Administrative Code, Article XXII

4.5.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts, in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the checklist questions that address the criteria in CEQA Guidelines Appendix G. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, and the unique characteristics of the proposed Plan.

Checklist questions for cultural resources are included in Section V of Appendix G. For purposes of this EIR, the Appendix G questions have been combined and modified. Specifically, Appendix G Section V criterion (a) regarding historical resources and criterion (b) regarding archaeological resources are addressed in CULT-1. Criterion (c) regarding disturbance of human remains is addressed in CULT-2.

The significance of a historical resource is materially impaired when a project demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its inclusion in or eligibility for inclusion in (1) the CRHR, (2) a local register, or its identification in a historical resources survey meeting the requirements of PRC Section 5024.1, or (3) as determined by a lead agency for purposes of CEQA (Guidelines Section 15064.5(b)(2).)

For purposes of this EIR, implementation of the proposed Plan would have a significant cultural resources impact if it would:

CULT-1 Cause a substantial adverse change in the significance of a historical resource[1] or unique archaeological resource.[2]

CULT-2 Disturb any human remains, including those interred outside of dedicated cemeteries, in violation of existing laws and regulations protecting human remains.

4.5.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

CULT-1 CAUSE A SUBSTANTIAL ADVERSE CHANGE IN THE SIGNIFICANCE OF A HISTORICAL RESOURCE OR UNIQUE ARCHAEOLOGICAL RESOURCE

ANALYSIS METHODOLOGY

This analysis examines the impacts on historical and unique archaeological resources that would result from implementation of the proposed Plan. The analysis identifies the general types of proposed Plan related

[1] See definition of *historical resource* in Section 4.5.2, *Regulatory Setting*.

[2] See definition of *unique archaeological resource* in Section 4.5.2.

activities with the potential for impacting historic architectural resources and archaeological resources, then analyzes the impacts.

A substantial adverse change to the significance of a historical resource is defined as the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the cultural resource would be materially impaired (CEQA Guidelines Section 15064.5); this definition can also be applied to a substantial adverse change to a unique archaeological resource.

Construction activities are more likely to disturb archaeological resources remains than operational activities because such resources are most likely to be encountered during initial ground disturbance. Impacts of operational activities on archaeological resources are unlikely to be significant, unless there are potential vibration impacts from rail transit operations or visual operational impacts on Tribal Cultural Resources (TCRs).

For forecasted regional growth and land use change projects, as well as planned transportation network improvements and programs, the likelihood of encountering archaeological resources is thus analyzed based on whether projects would require grading, excavation, or other ground-disturbing activities. Even minimal grading activities can encounter resources, as they have been discovered only inches below the surface. Ground-disturbing activities associated with infill, redevelopment, and infrastructure expansion have the potential to unearth these resources.

This analysis clearly distinguishes impacts on archeological resources from those on historic structures. Construction activities are most likely to affect historical resources of an architectural nature ("historic structures"). Impacts of operational activities on historic structures are unlikely to be significant, unless vibration impacts of rail transit operation on historic structures or visual operational impacts on historic structures are possible. Impacts could include demolition (for instance, an interchange reconfiguration may require demolition of structures in that area) or changes to the setting or viewshed of a historic structure (thereby affecting the integrity of its setting and its significance).

During the timeframe of the proposed Plan, climate change effects are likely to result in impacts in the San Diego region including, but not limited to, increased risk of wildfire throughout the region, increased flooding in low-lying areas, and flooding associated with beach loss and sea level rise in coastal areas. These effects are further detailed in Appendix C. The potential exacerbation of climate change effects from past, present, and reasonably foreseeable future projects, when combined with the incremental contribution of the proposed Plan, is discussed further in Chapter 5, *Cumulative Impact Analysis*, of this EIR. The potential for the proposed Plan to exacerbate climate change effects that may result in damage or destruction to cultural resources is evaluated as part of the analysis below.

2025

Regional Growth and Land Use Change

As discussed in Section 4.5.1 *Existing Conditions*, numerous historic architectural and archaeological resources have been documented throughout the San Diego region. These include historic architectural resources (e.g., historic buildings or structures) listed on federal, state, and local registers as well as archaeological sites and ethnographic resources, some of which include human remains. While many of these resources have been identified and documented within the San Diego region, there are likely many more resources that remain undiscovered.

As also discussed in Section 4.5.1, many areas within the San Diego region have a high potential to yield archaeological and historic architectural resources. The location of past discoveries can be useful in determining where unknown t resources are likely encountered. Intact archaeological resources are most likely encountered in previously undeveloped land, but both historic and archaeological resources are likely found in the downtown areas in older neighborhoods. Many of the areas within the County of San Diego, such as Lakeside and Fallbrook, have both large undeveloped areas where resources have been encountered in the past and old downtown areas that contain known historical resources. Lagoons and rivers were resource and transportation areas during prehistoric times, while coastal communities were some of the earliest and heaviest areas of settlement during historic times. For example, the earliest known archaic sites in the San Diego region were found near coastal lagoons and river valleys.

From 2016 to 2025, regional population is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). The 2025 regional land use pattern is shown in Figure 2-17. Approximately 79% percent of the forecasted regional population increase by 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent). Those same three jurisdictions accommodate approximately 78 percent of new housing units in the region by 2025, while the City of San Diego, National City, and the City of Chula Vista accommodate more than 70 percent of new jobs in the region by 2025.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases include Downtown, Mission Valley, Midway-Pacific Highway, and University Center. The highest proportions of forecasted job increases are in the communities of Downtown, University Center, Otay Mesa, and Kearny Mesa. In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases are Otay and North County Metro. The only significant increase in jobs over that period are in Otay.

Regional growth and land use change would result in a wide range of construction and ground-disturbing activities, such as excavation, grading, and clearing, which remove and/or disturb the upper layer of soils. Because archaeological resources have been found within inches of the ground surface in some areas of the San Diego region, like the downtown area or Otay Mesa, these resources can be encountered even during minor grading and ground-disturbing activities. In addition, redevelopment and intensification of land uses may result in the demolition or substantial alteration of historic resources in or near established urban areas or town centers, where built historic resources are typically located.

As Section 4.5.1 describes, there are many historic districts and built historic resources in the western portion of the region, particularly in the Downtown and Midway-Pacific Highway communities such as the Marine Corps Recruit Depot Historic District, the Naval Training Center, the Old Town San Diego Historic District, the San Diego Civic Center, and the Gaslamp Quarter Historic District. Because this portion of the region is forecasted to experience much of the growth under the proposed Plan, historic resources in these areas would be encountered. Increases in development intensity would also introduce visual, audible, and other effects that indirectly affect built historic resources or alter the setting that contributes to the resources' significance. Construction activities would be more likely to affect both historical and unique archaeological resources than operational activities. Forecasted growth and land use change would also result in indirect physical impacts on open space areas in less developed and unincorporated portions of the San Diego region such as in the Otay and North County Metro communities, and thus increase the likelihood of physical impacts on cultural resources located within those areas. For instance, increased recreational use of open space areas could promote erosion or increase the likelihood of damage to cultural resources through increased traffic (foot or otherwise).

Encountering such resources does not necessarily result in impacts on those resources. For instance, a new development could be constructed near an old neighborhood that has significant resources but not result in direct impacts because no demolition or alteration would occur, nor would the development result in indirect impacts if no changes would occur to the setting or viewshed. An archaeological resource could be encountered by earth-moving activities, but laws and regulations are in place to protect historical resources by avoidance and by requiring feasible mitigation if avoidance is not possible.

As illustrated in Section 4.5.2, numerous federal, State, and local laws, regulations, and programs are in place to protect cultural resources. For example, HSC Sections 18950–18961 and the Secretary of the Interior's Standards for Rehabilitation provide regulations for the restoration or rehabilitation of historic structures to preserve their original or restored architectural elements and features, while providing a safe building for occupants. Local policies and ordinances can provide cultural and historical resources with added protection by requiring surveys and giving them local designations of significance. Additionally, the Secretary of the Interior's Standards for the Treatment of Historic Properties were developed to help protect historical resources by promoting consistent preservation practices. Also, local jurisdictions have responsibilities to identify and mitigate adverse effects on significant cultural resources under CEQA.

Redevelopment and intensification of land uses may also result in the demolition or substantial alteration of historic resources or the removal of a significant archaeological site. Adherence to the existing laws, regulations, and programs discussed above would avoid and reduce impacts on historic architectural resources from construction of development projects associated with regional growth and land change, but there is no assurance that they would reduce impacts to a less-than-significant level for all projects. Therefore, regional growth and land use change would cause a substantial adverse change in the significance of a historical resource or unique archaeological resource. This is a significant impact.

Transportation Network Improvements and Programs

Some of the improvements in the proposed Plan from 2016 to 2025 would involve only operational changes that would not include construction of new transportation or transit facilities, such as increasing service frequencies or new transit routes within existing right-of-way. These changes would generally not lead to impacts on cultural resources.

However, the improvements that would involve construction of new infrastructure or facilities could encounter cultural resources. Highway improvements (such as lane expansions), construction of new Managed Lanes as part of the Complete Corridors program, and commuter rail upgrades as part of the Transit Leap program would require grading and other ground-disturbing activities.

These activities would remove and/or disturb the upper layer of soils and have the potential to unearth underlying archaeological and historic architectural resources and would cause a direct disturbance to buried resources. Given that numerous prehistoric sites are known to exist along the shores, estuaries, lagoons, and bluffs of the San Diego coastline, grading and ground-disturbance activities along the rail corridor between Del Mar and Oceanside (for upgrades to Pacific Surfliner, COASTER, and Metrolink, for example) and I-5 from Manchester to Vandergrift in Oceanside (in order to add two new Managed Lanes, for example), have the potential to encounter archaeological resources. Other known and unknown prehistoric and historic sites could be harmed by grading and construction of transportation network improvements. For federally funded projects, Section 106 of the NHPA and Section 4f of the Department of Transportation Act would reduce impacts on cultural resources because both regulations require that properties along the rail or road alignments be identified, and adverse effects to be avoided or mitigated.

In addition, construction of transportation network improvements may result in the demolition or substantial alteration of historic resources in or near established urban areas or town centers. Transportation network improvements would also introduce operational visual, audible, vibrational, and other effects that indirectly affect built historic resources or alter the setting that contributes to the resources' historic value, as well as negatively impact the structures through increased levels of corrosive air contaminates (Inkpen 2004), which may damage the exterior of historic buildings.

Transit improvements from 2016 to 2025, including investment in mobility hubs, upgrades to Pacific Surfliner, COASTER, Metrolink, freight, and Los Angeles-San Diego-San Luis Obispo (LOSSAN) services, and construction of a new station in the Gaslamp Quarter, would result in ground-disturbing activities in downtown San Diego, and north along the coast through to Oceanside. Because unique archaeological materials are routinely identified during excavations and monitoring of construction activities in downtown San Diego, existing unknown resources may be encountered. These are prime locations for the presence of historical or unique archaeological resources. Archaeological resources could also be identified during construction of highway and road improvements such as new toll lanes on SR 11 to the Otay Mesa POE, Interchange and Arterial Operational improvements at SR 94 and SR 125, Otay Mesa Port of Entry, and more than 25 planned improvements to local arterial streets at locations throughout the region, including widenings and extensions of existing roadways, new or replaced bridges, and realignments

Upon implementation of the individual transportation network improvements and programs included as part of the proposed Plan, both known and unknown archaeological and historic architectural resources would be encountered. As discussed above, while adherence to existing laws, regulations, and programs would avoid or reduce impacts on cultural resources when they are encountered during the construction of transportation network improvements, there is no assurance that they would reduce all impacts to a less-than-significant level for all future projects. Implementation of the proposed Plan would result in ground-disturbing activities related to transportation network improvements and programs that would cause a substantial adverse change in the significance of a historical resource or unique archaeological resource. This is a significant impact.

2025 Conclusion

Implementation of the proposed Plan would result in regional growth and land use change and transportation network improvements and programs that would cause a substantial adverse change in the significance of a historical resource or unique archaeological resource. Therefore, this impact (CULT-1) from 2016 to 2025 is significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional population is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). The 2035 regional land use pattern is shown in Figure 2-18. Approximately 80 percent of the forecasted regional population increase between 2025 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent). Similarly, these three jurisdictions accommodate approximately 76 percent of new housing units and 70 percent of new jobs, respectively, between 2025 and 2035.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases include Downtown, Mission Valley, Kearny Mesa, and Midway Pacific Highway. The highest proportions of forecasted job increases are in the communities of Downtown, Kearny Mesa, University and Otay

Mesa. In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases include Lakeside, North County Metro and Otay. The only significant increase in jobs over that period is in Otay.

As discussed in the 2025 analysis, many areas throughout the San Diego region have a high potential to yield archaeological and historic architectural resources. While most growth from 2026 to 2035 would occur in established urban areas such as Downtown San Diego, Chula Vista and National City, new growth in the region may occur in areas such as the Otay and North County Metro communities where archaeological and historic architectural resources are present, as historically or archaeologically significant resources have been found throughout the County (County of San Diego 2011). Built historical resources tend to be concentrated in historical town centers along the urban costal region but are also located in unincorporated areas of the county such as Lakeside, Otay and North County Metro. Built historical resources are also generally located along major roadways, such as I-8 and SR 78. In addition, some built resources exist within the unincorporated County that are historically significant but have not yet been designated (County of San Diego 2011). Regional growth and land use change forecasted to occur throughout the region from 2026 to 2035 would result in additional construction and ground-disturbing activities, such as such as excavation, grading, clearing, demolition, alteration, or structural relocation. Forecasted growth and land use change would also result in indirect physical impacts on open space areas, and thus increase the likelihood of physical impacts on cultural resources located within those areas. For instance, increased recreational use of open space areas could promote erosion or increase the likelihood of damage to cultural resources through increased traffic (foot or otherwise). These ground-disturbing activities, associated with infill, redevelopment, and/or expansion of infrastructure, have the potential to encounter archaeological and historic architectural resources.

As discussed in the 2025 analysis, while adherence to existing laws, regulations, and programs would reduce impacts on archaeological and historic architectural resources upon implementation of the proposed Plan, there is no assurance that they would reduce these impacts to a less-than-significant level for all projects. Given the potential for land use changes to cause substantial adverse changes in the significance of historical and unique archaeological resources coupled with the nonrenewable nature of these resources if disturbed or altered, implementation of the proposed Plan would result in ground-disturbing activities related to regional growth and land use change that would cause a substantial adverse change in the significance of a historical resource or unique archaeological resource. This is a significant impact.

Transportation Network Improvements and Programs

As discussed in the 2025 analysis, due to the rich historic and prehistoric background of the San Diego region, the potential for identified and unidentified historical and cultural resources to be found within transportation network improvement and program areas exists. Some of the improvements in the proposed Plan slated for completion between 2026 to 2035 would involve only operational changes that would not include construction of new transportation or transit facilities, such as increasing service frequencies or creating new transit routes, and therefore would have little impact on historical and unique archaeological resources. However, improvements that would involve construction of new infrastructure or facilities could encounter sensitive resources. Transportation construction projects would require grading, and potentially trenching, activities that remove and/or disturb the upper layer of soils and could unearth underlying archaeological resources and cause a direct disturbance to historical resources or unique archaeological resources.

Major rail-related transportation network improvements would include continued double-tracking at certain locations on the LOSSAN rail corridor, construction of the Del Mar Tunnel, new stations at Central Mobility Hub and Camp Pendleton, Anchor Mobility Hub at the San Ysidro Transit Center and grade separation at Leucadia

Boulevard. These improvements have the potential to impact archaeological resources that may be present along the shores, estuaries, lagoons, and bluffs of the San Diego coastline, as well as areas that have not been previously developed. If demolition of buildings is necessary for these projects and improvements, then historic architectural resources could also be disturbed.

Additional major transportation network improvements that could impact archaeological and historic architectural resources include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, SR 125, I-5, I-8, I-15, I-805. Direct Access Ramps (DARs) are assumed at: I-5/Clairemont Mesa Boulevard; I-5/Voigt Drive; and SR 125/Spring Street/SR 94. Shoulder widening and straightening improvements on SR 67 from Mapleview to Dye Road, and five additional improvements to local arterial streets. These projects also have the potential to impact archaeological and historic architectural resources resulting from ground disturbance or demolition.

Given the magnitude and location of several of the transportation network improvements and programs occurring between 2026 and 2035, and the number of additional transportation network improvements over those previously implemented by 2025, additional ground disturbances are anticipated. As a result, additional archaeological and historic resources would be encountered during construction activities between 2026 and 2035.

As discussed in the 2025 analysis, while adherence to the existing laws, regulations, and programs discussed in Section 4.5.2 would reduce impacts on cultural resources upon implementation of the proposed Plan, there is no assurance that they would reduce these impacts to a less-than-significant level for all future projects. Given the potential for transportation facilities to cause substantial adverse changes in the significance of cultural resources coupled with the nonrenewable nature of these resources if disturbed or altered, implementation of the proposed Plan would result in ground-disturbing activities related to transportation network improvements and programs that would cause a substantial adverse change in the significance of a historical resource or unique archaeological resource. This is a significant impact.

2035 Conclusion

Implementation of the proposed Plan would result in regional growth and land use change and transportation network improvements and programs that would cause a substantial adverse change in the significance of a historical resource or unique archaeological resource. Therefore, this impact (CULT-1) in between 2026 and 2035 is significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, regional population is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent). The 2050 regional land use pattern is shown in Figure 2-19. Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), San Marcos (13 percent), and City of Chula Vista (28 percent). Similarly, these three jurisdictions accommodate approximately 89 percent of new housing units and 72 percent of new jobs, respectively, between 2036 and 2050.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases include the Downtown, Midway Pacific Highway, and Uptown. The highest proportions of forecasted job increases are in the communities of Downtown, Otay Mesa, Kearny Mesa, and University City. In

the unincorporated County, the communities with the highest proportion of the forecasted population increases include Lakeside, North County Metro, and Valle de Oro. There are no housing units built in the Unincorporated area after 2035. The only significant increase in jobs over that period are in Otay.

As discussed in the 2025 and 2035 analyses, many areas throughout the San Diego region have a high potential to contain prehistoric and historic cultural resources. In addition to the resource-sensitive areas mentioned in the 2025 and 2035 analyses, the additional growth forecasted in both the unincorporated County and western portion of the region between 2036 and 2050 would result in new development in areas such as Otay and redevelopment in established urban areas such as Downtown, Kearny Mesa, and Midway-Pacific Highway. Additional construction and ground-disturbing activities, such as excavation, grading, clearing, demolition, alteration, or structural relocation, would occur. Forecasted growth and land use change would also result in indirect physical impacts on open space areas, such as in the Otay planning area, and thus increase the likelihood of physical impacts on cultural resources located within those areas. For instance, increased recreational use of open space areas could promote erosion or increase the likelihood of damage to cultural resources through increased traffic (foot or otherwise). These ground-disturbing activities, associated with infill, redevelopment, and/or expansion of infrastructure, have the potential to impact archaeological and historic architectural resources. With additional growth, and increased development intensities, and increased use of open space areas, the extent of impacts on archaeological and historic architectural resources by 2050 would be greater than that experienced by 2025 and 2035 as more resource-sensitive land would be disturbed over time.

As more land is disturbed and altered for new development and redevelopment between 2036 and 2050, the possibility of irreversible losses of significant archaeological and historic architectural resources becomes greater. As discussed in the 2025 and 2035 analyses, while adherence to the existing laws, regulations, and programs would reduce impacts on archaeological and historic architectural resources upon implementation of the proposed Plan, there is no assurance that they would reduce these impacts to a less-than-significant level. Given the potential for land use changes to cause substantial adverse changes in the significance of cultural resources, coupled with the nonrenewable nature of these resources if disturbed or altered, implementation of the proposed Plan would result in ground-disturbing activities related to regional growth and land use change that would cause a substantial adverse change in the significance of a historical or archaeological resource. This is a significant impact.

Transportation Network Improvements and Programs

As true in the 2025 and 2035 analysis, potential exists for identified and unidentified archaeological and historic architectural resources to occur in transportation network improvement and program areas. Some of the improvements in the proposed Plan that would be implemented between 2036 and 2050 would include only operational changes that would not include construction of new transportation or transit facilities, such as increasing service frequencies or new transit routes within existing right-of-way. However, those that would involve construction of new infrastructure or facilities could result in impacts. Major rail projects and improvements such as continued double-tracking along certain LOSSAN corridor locations, construction of Sorrento Mesa and UTC tunnels and a new station at Balboa Avenue, and three new commuter rail lines between Downtown San Diego and El Cajon; National City to U.S. Border, and Central Mobility to the U.S. Border have the potential to impact archaeological and historic architectural resources resulting from ground disturbance or demolition. Highway improvements such as Managed Lane construction along I-5, I-8, I-15, I-805, SR 52, SR 54, SR 56, SR 125, and SR 905 would require grading and, potentially, trenching activities that remove and/or disturb the upper layer of soils, and could encounter underlying archaeological and historic architectural resources. Shoulder widening and road straightening along rural highways such as SR 76, SR 78,

SR 79, SR 94 and I-8 would occur in areas that have seen relatively little development would disturb new ground. Various rail improvements to the Trolley, SPRINTER and COASTER lines have the potential to encounter historical resources since historic period archaeological materials are routinely identified during excavations and monitoring of construction activities in downtown San Diego and the coastal region.

Any ground disturbances associated with these transportation network improvements may unearth underlying archaeological and historic architectural resources and cause a direct disturbance to buried resources. Given the magnitude and location of several of the transportation network improvements occurring between 2036 and 2050, and the number of additional transportation network improvements over those previously implemented by 2020 and 2035, additional significant ground disturbances are anticipated. It is possible that more archaeological and historic architectural resources would be disturbed between 2036 and 2050.

As discussed in the 2025 and 2035 analyses, while adherence to the existing laws, regulations, and programs would reduce impacts on archaeological and historic architectural resources upon implementation of the proposed Plan, there is no assurance that they would reduce these impacts to a less-than-significant level for all future projects. Implementation of the proposed Plan would result in ground-disturbing activities related to transportation network improvements and programs that would cause a substantial adverse change in the significance of the resource. Given the potential for transportation facilities to cause substantial adverse changes in the significance of archaeological and historic architectural resources coupled with the nonrenewable nature of these resources if disturbed or altered, this is a significant impact.

2050 Conclusion

Implementation of the proposed Plan would result in regional growth and land use change and transportation network improvements and programs that would cause a substantial adverse change in the significance of a historical resource or unique archaeological resource. Therefore, this impact (CULT-1) between 2036 and 2050 is significant.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan may result in ground disturbances and increased foot activity due to construction, demolition, and increased recreational use of open spaces. These effects could result in increased erosion or disturb the upper layer of soils, unearthing underlying archaeological and historic architectural resources and causing a disturbance to buried resources. Climate change effects may be exacerbated by this impact. Climate change is likely to result in increased erosion due to more wildfires, which burn vegetation and destabilize soil; more flooding, which results in runoff that increases erosion; and sea-level rise, which can worsen coastal erosion. Thus, the proposed Plan's impact on increased erosion may exacerbate climate change impacts that also increase erosion and thus affect cultural resources.

Increased coastal development can especially affect cultural resources. As the San Diego region used to hold numerous coastal villages, coastal areas may have abundant cultural resources of historic and archaeological importance. Climate change impacts, such as increased sea-level rise, storm surge, and coastal erosion, can result in flooding and wave damage to cultural resources. Thus, the proposed Plan's impact on increased disturbance to coastal areas may exacerbate climate change impacts that also threaten coastal cultural resources.

MITIGATION MEASURES

CULT-1 SUBSTANTIAL ADVERSE CHANGE IN THE SIGNIFICANCE OF A HISTORICAL RESOURCE OR UNIQUE ARCHAEOLOGICAL RESOURCE

2025, 2035, and 2050

CULT-1a Develop Project-Level Measures for Development Projects and Transportation Network Improvements. During project-level CEQA review of development projects or transportation network improvements that would cause a substantial adverse change in the significance of a CEQA-defined historical resource or significantly affect a unique archaeological resource, the County of San Diego, cities, and other local jurisdictions can and should, or SANDAG shall, and other transportation project sponsors can and should, develop project-level protocols and mitigation measures, consistent with CEQA Guidelines Section 15126.4(b) and in consultation with the State Historic Preservation Officer (SHPO) as needed, to avoid substantial adverse changes to CEQA-defined historical resources and unique archaeological resources. The local lead agency can and should, SANDAG shall, and other transportation project sponsors can and should allow for adequate resources to identify (through survey, consultation, or other means) cultural resources in order to develop minimization and avoidance methods where possible, and will/can and should consult with appropriate Native American representatives to provide necessary input as to resources that are of concern. These may include natural areas that contain resources of importance to tribes if they are historical resources or unique archaeological resources. Project-level mitigation measures include, but are not limited to, the following:

Archaeological Resources

- Where feasible, avoid impacts on archaeological resources by preservation in place by:
    - Avoiding archaeological sites
    - Deeding archaeological sites into permanent conservation easements
    - Capping or covering archaeological sites with a layer of soil before building on the sites
- If preservation in place is not feasible, reduce impacts on archaeological sites by completing a data recovery program conducted in compliance with CEQA Guidelines Section 15126.4(b). (A data recovery program for archaeological sites consists of excavation of a percentage of the site—determined in consultation with the lead agency—to provide information necessary to answer significant research questions.)

Historic Architectural Resources

- Conduct maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation, relocation, or reconstruction to reduce impacts on historic structures, and have a qualified architectural historian or historic architect review mitigation plans to review consistency with the Secretary of the Interior's Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.
- If avoidance of a built historic resource is not feasible, apply additional mitigation options including, but not limited to, specific design plans for historic districts, or plans for alteration or adaptive reuse of a historical resource that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitation, Restoring, and Reconstructing Historic Buildings.
- If demolition of a historic structure must occur, apply mitigation options such as recordation including a building description, historical narrative, and photographic documentation of the building and

appropriate as-built drawings similar to the Historic American Building Survey documentation outlined by the National Park Service (National Park Service 2015).

CULT-1b Implement Monitoring and Data Recovery Programs for Development Projects and Transportation Network Improvements. During project-level CEQA review and during construction of development projects, the County of San Diego, cities, and other local jurisdictions can and should, or during construction of transportation network improvements, SANDAG shall, and other transportation project sponsors can and should, implement monitoring and data recovery measures to reduce impacts on both known and undiscovered CEQA-defined historical resources and unique archaeological resources, including but not limited to the following:

- Require areas identified in any required monitoring and mitigation plan to be monitored during the grading phase of individual projects by a qualified archaeologist and tribal monitor if needed.
- Should an archaeological deposit and/or feature be encountered during construction activities that is determined to be a historical resource or unique archaeological resource by a qualified archaeologist, stop ground-disturbing activities and prepare and/or implement an Archaeological Data Recovery Program (ADRP) in consultation with SHPO and/or, when applicable, qualified local agency staff with technical expertise in archaeological and cultural resources management.
- Integrate curation of archaeological and/or historical artifacts and associated records in a regional center focused on the care, management, and use of archaeological collections if the artifact must be excavated. This does not include Native American human remains and associated burial items, the disposition of which should be determined in consultation with the MLDs (see Impact CULT-2).

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of the proposed Plan would result in significant impacts on historical and unique archaeological resources through construction and ground-disturbing activities in 2025, 2035, and 2050. Implementation of mitigation measures CULT-1a and CULT-1b would reduce impacts through proper resource handling, surveys, regulatory compliance, and mitigation monitoring. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, this impact (CULT-1) would remain significant and unavoidable.

CULT-2 DISTURB ANY HUMAN REMAINS, INCLUDING THOSE INTERRED OUTSIDE OF DEDICATED CEMETERIES, IN VIOLATION OF EXISTING LAWS AND REGULATIONS PROTECTING HUMAN REMAINS

ANALYSIS METHODOLOGY

Both forecasted regional growth and land use change, and planned transportation network improvements and programs have the potential to encounter buried remains during grading, excavation, and other ground-disturbing activities. Construction activities are more likely to disturb human remains than operational activities because human remains are most likely to be encountered with initial ground disturbance.

Impacts of the proposed Plan are analyzed in combination with existing laws and regulations, such as HSC Section 7050.5, PRC Section 5097.98, and local ordinances, to determine significance. For forecasted regional growth and land use change projects, as well as planned transportation network improvements, the likelihood of encountering human remains is analyzed based on whether projects would require grading, excavation, or

other ground-disturbing activities. Even minimal grading activities can encounter remains, as they have been discovered only inches below the surface. Ground-disturbing activities associated with infill, redevelopment, and infrastructure expansion have the potential to unearth remains.

PRC Section 5097 specifies the procedures to be followed in the event of the unexpected discovery of human remains on nonfederal public lands. HSC 7050.5 addresses the protection of human remains discovered in any location other than a dedicated cemetery. These, together with the provisions in the CEQA Guidelines, provide specific guidance for addressing such remains before resuming excavation or disturbance of the project site. The HSC and PRC sections provide consultation and treatment options as well as outline appropriate communication protocols and discuss the need to maintain respect for and dignity of the remains and associated materials.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

The likelihood of encountering human remains is greatest for projects that include grading and/or excavation of areas on which past grading and/or excavation activities have been minimal. Because human remains have been found within inches of the ground surface throughout the San Diego region, even minimal grading activities can impact these resources. Excavation and soil removal of any kind, irrespective of depth, have the potential to yield human remains. While new development and redevelopment occurring by 2025 in the region would mostly result in the intensification of previously developed areas, ground-disturbing activities associated with infill, redevelopment, and/or expansion of infrastructure have the potential to unearth and impact buried human remains.

Given the regional growth and land use change forecasted by 2025, implementation of the proposed Plan would result in the intensification of land uses along established transportation corridors and waterways where human remains may be located. For instance, human remains have been found in the San Diego River valley. As discussed in Section 4.5.2, Native American human burials have specific provisions for treatment in PRC Section 5097.98 and HSC 7050.5 as well as other laws and regulations. By halting all construction activities if human remains are found, impacts on those remains or any other remains or associated burial items also in that area can be avoided. NAGPRA also establishes procedures to be followed in the event of a discovery of Native American human remains on federal lands, stipulates that Native American cultural items must be returned to affiliated tribes and lineal descendants, and prevents the illegal trafficking of these items. This law provides additional protection and allows for proper handling of Native American human remains and associated burial items.

Regional growth and land use changes projects implementing the proposed Plan would be required to adhere to the laws and regulations discussed above and listed in Section 4.5.2. These laws outline appropriate treatments and the protocols for discussions regarding treatment options with MLDs; therefore, impacts associated with the disturbance of human remains would be less than significant.

Transportation Network Improvements and Programs

Some of the transportation network improvements and programs in the proposed Plan completed by 2025 would involve only operational changes that would not include construction of new transportation or transit facilities, such as increasing service frequencies or operation of new transit routes within existing rights-of-

way. These operational changes would have minimal impact on human remains. However, transportation improvements that would involve construction of new infrastructure or facilities could encounter human remains.

The likelihood of encountering human remains is greatest for projects that include grading and/or excavation of areas where past grading and/or excavation activities have been minimal; however, there is the potential to encounter human remains in previously developed areas. Because human remains have been found within inches of the ground surface in some areas of the San Diego region, even minimal grading activities can encounter these resources. Excavation and soil removal of any kind, irrespective of depth, have the potential to yield human remains. For example, upgrades to Pacific Surfliner, COASTER, Metrolink, freight, and LOSSAN services, including construction of a new station in the Gaslamp Quarter, would result in ground-disturbing activities in downtown San Diego, and north along the coast through to Oceanside. Because historic period archaeological materials are routinely identified during excavations and monitoring of construction activities in the Old Town and downtown areas, existing unknown resources, including buried human remains, may be encountered within these rail improvement areas. Additionally, numerous prehistoric sites are known to exist along the shores, estuaries, lagoons, and bluffs of the San Diego coastline. For example, rail improvements along coastal San Diego County would occur in prime locations for early historic transportation and trade activities, as well as for prehistoric habitation.

The transportation network improvements have the potential to uncover previously undiscovered human remains because some would take place in previously undisturbed or minimally disturbed areas. As discussed above, future transportation network improvements implemented by the proposed Plan would be required to adhere to existing laws and regulations. Therefore, impacts associated with the disturbance of human remains would be less than significant because those laws and regulations would ensure the appropriate handling of any human remains that are encountered.

2025 Conclusion

Implementation of the proposed Plan has the potential to uncover buried human remains through ground-disturbing activities in 2025. The requirement to follow existing laws and regulations ensures that any human remains encountered are treated appropriately. Therefore, this impact (CULT-2) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change

The likelihood of encountering human remains is greatest for projects that include grading and/or excavation of areas on which past grading and/or excavation activities have been minimal. This would include areas of expansion in unincorporated portions of the region where there has previously been less development.

Although the majority of regional growth and land use change will occur in the more densely populated coastal region, between 2036 and 2050 it is expected that some development will also increase in unincorporated portions of the region. Because archaeological resources have been found within inches of the ground surface throughout the San Diego region, even minimal grading activities can impact these resources. Excavation and soil removal of any kind, irrespective of depth, have the potential to yield human remains. While most new development and redevelopment would mostly result in the intensification of previously developed areas, ground-disturbing activities associated with infill, redevelopment, and/or expansion of infrastructure have the potential to unearth buried human remains.

As discussed in the 2025 analysis above, the types of activities that would result in significant impacts on human remains (i.e., excavation, grading, soil removal associated with infill, redevelopment, and/or expansion of infrastructure) would continue to occur into 2035 as development intensities would increase to accommodate the forecasted growth. With more construction anticipated to occur within previously unearthed areas, there is an increased potential to discover archaeological deposits or buried human remains.

By 2035, the extent of impacts on archaeological deposits or buried human remains would be greater than that experienced by 2025 as more land would be disturbed over time during development and redevelopment activities. As discussed in the 2025 analysis, if human remains were to be encountered during construction, work would halt in that area and the procedures set forth in PRC Section 5097.98 and HSC Section 7050.5 would be undertaken. Impacts associated with the disturbance of human remains would be less than significant because existing laws and regulations would ensure the appropriate handling of any human remains that are encountered.

Transportation Network Improvements and Programs

Some of the transportation network improvements and programs in the proposed Plan completed by 2035 would involve only operational changes that would not include construction of new transportation or transit facilities, such as increasing service frequencies or new transit routes within existing rights-of-way. These changes would have minimal effects on human remains. However, transportation improvements that would involve construction of new infrastructure or facilities could result in impacts as the likelihood of encountering human remains is greatest for projects that include grading and/or excavation of areas on which past grading and/or excavation activities have been minimal. Construction of transportation network improvements, such as Next Gen Rapid Transit, shoulder widening along SR 67, and road straightening along SR 67, SR 78, and SR 78 would likely disturb new ground areas. Because human remains have been found within inches of the ground surface in some areas of the San Diego region, even minimal grading activities can impact these resources. Excavation and soil removal of any kind, irrespective of depth, have the potential to yield human remains.

As with the 2025 analysis, any ground disturbances associated with transportation network improvements and programs may expose buried human remains. Given the magnitude and location of several of the transportation network improvements occurring by 2035, and the number of additional transportation network improvements over those previously implemented by 2025, additional ground disturbances are anticipated, and it is possible that, as more land is disturbed, buried human remains may be unearthed, and the extent of these impacts would increase over time. As discussed above, if human remains were encountered during construction, work would halt in that area and the procedures set forth in PRC Section 5097.98 and HSC Section 7050.5 would be undertaken. Impacts associated with the disturbance of human remains would be less than significant because existing laws and regulations would ensure the appropriate handling of any human remains that are encountered.

2035 Conclusion

Implementation of the proposed Plan has the potential to uncover buried human remains through ground-disturbing activities in 2035. The requirement to follow existing laws and regulations ensures that any human remains encountered are treated appropriately. Therefore, this impact (CULT-2) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change

While most new development and redevelopment associated with the proposed Plan would result in the intensification of previously developed areas, ground-disturbing activities associated with infill, redevelopment, and/or expansion of infrastructure have the potential to unearth human remains. As with 2025 and 2035, by 2050 there would be increasing development in areas farther inland, for example, in Escondido and San Marcos. These areas have previously experienced less ground disturbance relative to the coastal region. As with the 2025 and 2035 analyses, when more is disturbed and altered for new development and redevelopment anticipated as part of the proposed Plan, the possibility for encountering human remains becomes greater.

As discussed in the 2025 and 2035 analyses, if human remains were to be encountered during construction, work would halt in that area and the procedures set forth in PRC Section 5097.98 and HSC Section 7050.5 would be undertaken. Impacts associated with the disturbance of human remains would be less than significant because existing laws and regulations would ensure the appropriate handling of any human remains that are encountered.

Transportation Network Improvements and Programs

As with the 2025 and 2035 analyses, due to the rich historic and prehistoric background of the San Diego region, the potential for human remains to occur within the transportation network improvement and program areas associated with the proposed Plan exists. Some of the improvements in the proposed Plan implemented by 2050 would involve only operational changes that would not include construction of new transportation or transit facilities, such as increasing service frequencies or new transit routes within existing rights-of-way. These improvements should have no impact on human remains as they would be in previously disturbed areas. However, transportation improvements that would involve construction of new infrastructure or facilities could result in impacts on buried human remains. For example, widening of the highways or construction of new Managed Lanes and Next Gen Rapid Transit would require grading and possibly other ground-disturbing activities that remove and/or disturb the upper layer of soils, which could unearth underlying buried resources, including human remains.

Any ground disturbances associated with these transportation network improvements and programs may unearth underlying human remains. Given the magnitude and location of several of the transportation network improvements and programs occurring by 2050, and the number of additional transportation network improvements over those previously implemented by 2025 and 2035, additional significant ground disturbances are anticipated. It is, therefore, possible that more buried human remains would be encountered by 2050.

As discussed in the 2025 and 2035 analyses, if human remains are encountered during construction, work would halt in that area and the procedures set forth in PRC Section 5097.98 and HSC Section 7050.5 would be undertaken. Impacts associated with the disturbance of human remains would be less than significant because existing laws and regulations would ensure the appropriate handling of any human remains that are encountered.

2050 Conclusion

Implementation of the proposed Plan has the potential to uncover buried human remains through ground-disturbing activities in 2050. The requirement to follow existing laws and regulations ensures that any human remains encountered are treated appropriately. Therefore, this impact (CULT-2) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

While the proposed Plan may result in activities that uncover human remains, laws and regulations in place to ensure appropriate handling make this impact less than significant. Climate change impacts of sea-level rise, flooding, wildfire, and landslides could potentially reveal or damage human remains, and these remains could then become exposed to climate hazards such as extreme heat and precipitation. However, due to existing laws and regulations, the proposed Plan is unlikely to exacerbate the effects of climate change.

4.6 ENERGY

This section evaluates energy impacts that would result from implementing the proposed Plan.

4.6.1 EXISTING CONDITIONS

This section provides an overview of existing energy conditions applicable to the proposed Plan within the San Diego region.

STATE ENERGY RESOURCES AND USE

California has a diverse portfolio of energy resources, which produced approximately 2,536 trillion British thermal units[1] (BTUs) in 2017. Excluding offshore areas, the state ranked seventh in the nation in crude oil production, producing the equivalent of 996.4 trillion BTUs in 2017. The state also ranked third in the nation in conventional hydroelectric generation (3,134,000 megawatt hours [MWh]); second in the nation for net electricity generation from renewable resources; and first for production of electricity from solar, geothermal, and biomass resources. Other energy sources in the state include natural gas (236.8 trillion BTUs), nuclear (182.2 trillion BTUs), and biofuels (29.8 trillion BTUs) (U.S. Energy Information Administration 2018).[2]

According to the U.S. Energy Information Administration, California consumed approximately 7,829 trillion BTUs of energy in 2019. Per capita energy consumption (i.e., total energy consumption divided by the population) in California is among the lowest in the country, with 202 million BTU in 2019, which ranked 48th among all states. Natural gas accounted for the majority of energy consumption (28 percent), followed by motor gasoline (22 percent), distillate and jet fuel (15 percent), interstate electricity (9 percent), and nuclear and hydroelectric power (7 percent), with the remaining 19 percent coming from a variety of other sources (U.S. Energy Information Administration 2021a). Figure 4.6-1 provides a breakdown of California energy consumption by source in 2019.

Per capita energy consumption, in general, is declining due to improvements in energy efficiency and design. However, despite this reduction in per capita energy use, the state's total overall energy consumption (i.e., non-per capita energy consumption) is expected to increase over the next several decades due to growth in population, jobs, and vehicle travel. For example, electricity usage is anticipated to grow about 9 to 15 percent between 2020 and 2030 (California Energy Commission 2018).

Figure 4.6-2 provides a breakdown of California energy consumption by sector in 2019. The transportation sector consumed the highest quantity of energy (39.4 percent), followed by the industrial (23.1 percent), commercial (18.8 percent), and residential (18.7 percent) sectors (U.S. Energy Information Administration 2021b).

REGIONAL ENERGY RESOURCES AND USE

In 2019, the San Diego region consumed 19,408 million kilowatt hours (kWh) of electricity (California Energy Commission 2020a), which is approximately 7 percent of the total electricity consumed in California, and

[1]One BTU is the amount of energy required to heat 1 pound of water by 1°F at sea level. BTU is a standard unit of energy that is used in the United States and is on the English system of units (foot-pound-second system).

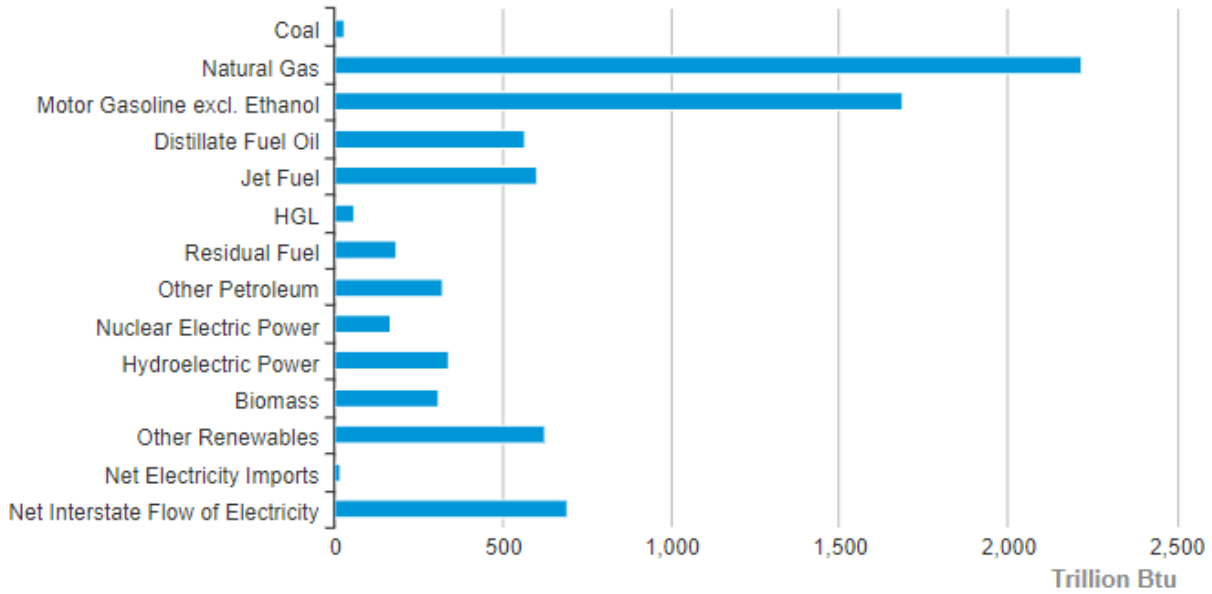
[2]No coal production occurs in California.

534 million therms of gas (California Energy Commission 2020b), or 4 percent of the state's total (U.S. Energy Information Administration 2021a).

The San Diego region is served by San Diego Gas and Electric (SDG&E), which provides energy service to 3.6 million customers (1.4 million accounts) in the region and portions of southern Orange County. The utility has a diverse power production portfolio, composed of a variety of renewable and non-renewable sources. Energy production typically varies by season and by year. Regional electricity loads also tend to be higher in the summer because the higher summer temperatures drive increased demand for air-conditioning. In contrast, natural gas loads are higher in the winter because the colder temperatures drive increased demand for natural gas heating.

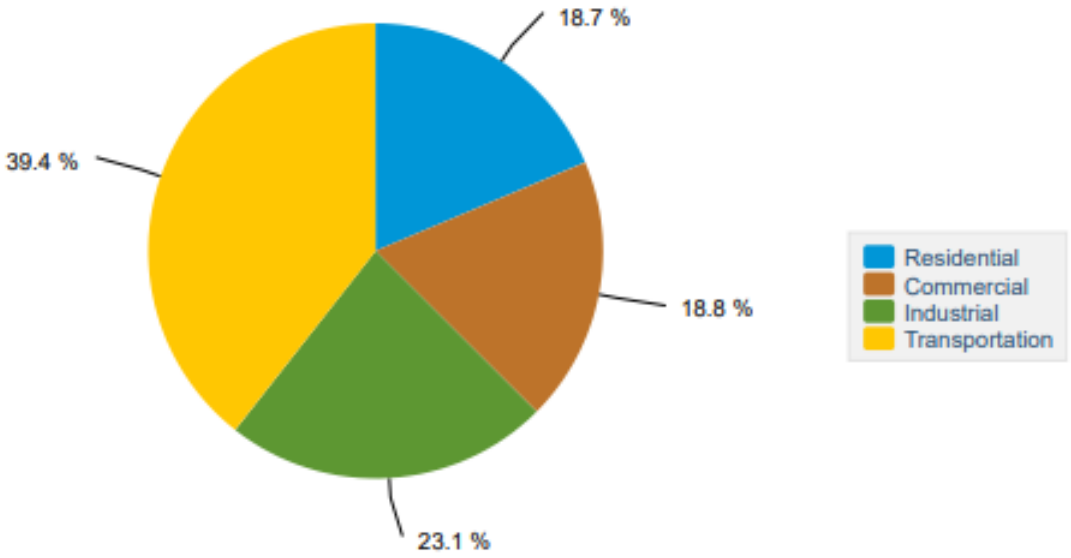
In 2019 (the most recent year for which California Renewables Portfolio Standard [RPS] data is available) approximately 31.3 percent of the electricity SDG&E supplied was from eligible renewable sources, compared to less than 1 percent in 2002 (California Energy Commission 2020c). In 2018, SDG&E programs reduced their consumer electricity use by more than 243 gigawatt hours (GWh), and their gas usage by more than 3.27 million therms (Sempra Energy Company 2020).

Figure 4.6-1. California Energy Consumption Estimates for 2019



Source: U.S. Energy Information Administration 2021a.

Figure 4.6-2. California Energy Consumption by End-Use Sector for 2019



Source: U.S. Energy Information Administration 2021bd.

Based on the California Air Resources Board (CARB) Emission Factor (EMFAC) model, in 2019 onroad motor vehicles in the County consumed approximately 1.4 billion gallons of gasoline and 126 million gallons of diesel fuel (CARB 2021).

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

Climate change may affect energy resources due to sea-level rise submerging coastal lands, more frequent and severe flooding, higher temperatures, and higher incidence of wildfire. The San Diego region is likely to experience sea level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix C.

Climate change could lead to an increase in energy usage in California. For example, *Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks of from Climate Change in California* (Moser et al. 2012), explains that increases in average temperature and extreme heat events will drive up the demand for summer cooling. This can occur both in buildings and in transportation (e.g., personal vehicles, buses, subways, etc.). This will be exacerbated by new residential development and expanded use of air conditioning, should the net result of the growth of energy demand from new housing stock outpace energy efficiency gains in the existing housing stock. Growing demand will probably not be offset by the decreased heating needs in winter, particularly because California's residential sector uses relatively little electricity for heating (Moser et al. 2012). Climate impacts on other sectors may also increase energy demand; for example, drought conditions may cause more pumping, conveyance, or treatment of water, which all require energy.

There have been some studies that have attempted to quantify the net effect on energy demand. However, some of these studies are increasingly dated, and none are focused specifically on the San Diego region. As a result, it is difficult to draw conclusions about how much energy usage in the San Diego region will increase due to

climate change. However, these studies do provide some context to the potential extent of energy increases. It is expected that demand for electricity will increase as households operate air conditioners more often, with an estimated increase in household energy usage of 3 percent (Guegan et al. 2012 citing Franco and Sanstad 2006) or 7 percent[3] (Ranson et al. 2014, OPR et al. 2018) on the low end to 70 percent (Auffhammer and Aroonruengsawat 2012[4]) on the high end by 2100. Climate change would cause impacts outside of increased demand for energy. For example, variation in rainfall may alter hydropower generation, storage potential, and generation capacity substantially. In particular, a summer water shortage is of concern because it reduces hydropower capacity when summer energy demand is the highest (Guegan et al. 2012). If hydropower is reduced, it is not clear what energy source would replace it, although the State's renewable energy requirements may help limit the extent that hydropower is replaced by fossil fuels. Moreover, the actual amount of reduction in hydropower due to climate change has not been quantified.

4.6.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

National Energy Act of 1978

The National Energy Act of 1978 included the Public Utility Regulatory Policies Act (Public Law 95-617), Energy Tax Act (Public Law 95-318), National Energy Conservation Policy Act (Public Law 95-619), Power Plant and Industrial Fuel Use Act (Public Law 95-620), and the Natural Gas Policy Act (Public Law 95-621).

The intent of the National Energy Act was to promote greater use of renewable energy, provide residential consumers with energy conservation audits to encourage slower growth of electricity demand, and promote fuel efficiency. The Public Utility Regulatory Policies Act created a market for nonutility electric power producers to permit independent power producers to connect to their lines and to pay for the electricity that was delivered.

The Energy Tax Act promoted fuel efficiency and renewable energy through taxes and tax credits. The National Energy Conservation Policy Act required utilities to provide residential consumers with energy conservation audits and other services to encourage slower growth of electricity demand.

Energy Policy Act of 1992

The Energy Policy Act of 1992 was passed to reduce the country's dependence on foreign petroleum and improve air quality. The act includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in in metropolitan areas. The act requires certain federal, state, and local government and private fleets to purchase a percentage of light-duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are also included in the act. Federal tax deductions are allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to

[3] California's Fourth Assessment projects climate change to increase yearly average temperatures in San Diego County by about 7–9 ºF (3.6–5 ºC) by 2100 under representative concentration pathway (RCP) 8.5.

[4] Auffhammer and Aroonruengsawat (2012) did not account for energy efficiency improvements of buildings, equipment, or the electricity system.

consider a variety of incentive programs to help promote AFVs. The act also includes definitions for "alternative fuels," and includes fuels such as ethanol, natural gas, propane, hydrogen, electricity, and biodiesel.

Energy Policy Act of 2005

The Energy Policy Act of 2005, implemented by the U.S. Department of Energy, was intended to establish a comprehensive, long-term energy policy. The Energy Policy Act addresses energy production in the U.S., including oil, gas, coal, and renewable forms of energy, and energy efficiency and tax incentives. Energy efficiency and tax incentive programs include credits for the construction of new energy-efficient homes and the production or purchase of energy-efficient appliances, and loan guarantees for entities that develop or use innovative technologies that avoid the production of GHGs.

Energy Independence and Security Act of 2007

Signed into law in December 2007, the Energy Independence and Security Act was passed to increase the production of clean renewable fuels; increase the efficiency of products, buildings, and vehicles; improve the energy performance of the federal government; and increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy. The Energy Independence and Security Act included the first increase in fuel economy standards for passenger cars since 1975. The act also included a new energy grant program for use by local governments in implementing energy-efficiency initiatives, as well as a variety of green building incentives and programs.

Executive Orders

There are two primary federal EOs related to the energy production, renewable energy, and energy reduction.

- **EO 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.** Directs the heads of all agencies to review immediately all agency actions adopted during the former administration that conflict with the current administration's public health, climate, and environmental policy objectives and to take action as appropriate and consistent with applicable law. This EO further directs the heads of the relevant agencies to consider new rules that would suspend, revise, or rescind specific regulations enacted or proposed during the former administration regarding vehicle fuel economy standards, appliance and building efficiency standards, among others, to ensure that such standards cut pollution. EO 13990 repeals many energy-related executive orders from the former administration that sought to advance natural resource development on federal lands, including EO 13783.
- **EO 13834, Efficient Federal Operations.** Designates a Federal Chief Sustainability Officer to head an Office of Federal Sustainability along with Chief Sustainability Officers to head each agency and report to the Chairman of the Council on Environmental Quality regarding implementation of sustainability goals.

Fuel Economy Standards

The National Highway Traffic Safety Administration (NHTSA) and U.S. Environmental Protection Agency (EPA) set the Corporate Average Fuel Economy Standards (CAFE) standards to improve the average fuel economy and reduce greenhouse gas (GHG) emissions generated by cars and light duty trucks. NHTSA and EPA amended the fuel efficiency standards for passenger cars and light trucks and established new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule). NHTSA and EPA also issued a regulation revoking California's Clean Air Act waiver, which had allowed the State to set its own emissions standards, asserting that the waiver was preempted by federal law (SAFE Rule Part One, 84 *Federal Registers* 51310, September 27 2019.).

California, 22 other states, the District of Columbia, and two cities have filed suit against the SAFE Rule Part One (*California et al. v. United States Department of Transportation et al*., 1:19-cv-02826, U.S. District Court for the District of Columbia). The lawsuit requests a "permanent injunction prohibiting Defendants from implementing or relying on the Preemption Regulation," but does not stay its implementation during legal proceedings. Part One of the SAFE Vehicles Rule went into effect on November 26, 2019. SAFE Rule Part Two was finalized on March 31, 2020, and went into effect on June 29, 2020. The SAFE Rule Part Two updates the national fuel economy standards for light duty vehicles from 54 miles per gallon to 40 miles per gallon in future years. The current administration has proposed a new rule that would supersede SAFE Rule Part One and would restore California's waiver to set its own standards. The current administration also plans to propose a new rule to increase the standards substantially compared to the current standards.

For further information on CAFÉ standards refer to Section 4.3, *Air Quality.*

Heavy-Duty Vehicle Program

The EPA and NHTSA also sets fuel efficiency and GHG standards for medium- and heavy-duty trucks. In 2011, EPA and NHTSA finalized a joint rule that established a national program to reduce GHG emissions and improve fuel economy for new medium- and heavy-duty engines and vehicles. This rule—called the Phase 1 standards—requires fuel efficiency standards for engines in model years 2014 through 2018. In 2016, EPA and NHTSA adopted the Phase 2 standards, which require fuel efficiency standards for engines in model years 2018 through 2027 (EPA 2016).

Construction Equipment Emission Standards

The Code of Federal Regulations established tiered emissions standards for construction equipment (i.e., non-road diesel engines) in order to phase in cleaner burning equipment that will reduce nitrogen oxides (NO_X) and particulate matter emissions from exhaust. After 2014, all construction equipment manufactured in the U.S. is required to meet the highest tier of emission standards, Tier 4. The EPA oversees implementation of these regulations (Code of Federal Regulations Chapter 40, Parts 1039, 1065, and 1068). For further information on these construction equipment standards, refer to Section 4.3.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

The State of California has adopted various laws addressing various aspects of energy production, energy conservation, energy efficiency, and renewable energy. Much of this establishes a broad framework for the state's long-term GHG and energy reduction goals and climate change adaptation program. Governors have also issued several Executive Orders (EOs) related to the state's evolving climate change policy. A summary of key laws, regulations, plans, and policies, are relevant to the proposed Plan is provided below, organized by general categories. Additional climate change laws, regulations, plans, and policies affecting the energy sector are reviewed in Section 4.8, *Greenhouse Gas Emissions*.

Executive Orders

There are two primary EOs applicable to the state's efforts on energy efficiency, energy consumption, electric vehicles (EVs) and renewable energy:

- **EO B-18-12 (2012).** Sets GHG and energy consumption reduction targets, in addition to zero net energy targets, for State agencies, departments, and other entities. B-18-12 also requires all new State buildings and major renovations beginning design after 2025 be constructed as zero net energy facilities with an

interim target for 50 percent of new facilities beginning design after 2020 to be zero net energy. State agencies must also take measures toward achieving zero net energy for 50 percent of the square footage of existing state-owned buildings by 2025.

- **EO N-19-19 (2019).** Among other things, this EO required the Department of Finance to create a Climate Investment Framework; required the State Transportation Agency to align transportation spending with achieving the objectives of the Climate Change Scoping Plan (discussed below) and to reduce vehicle miles traveled (VMT) through strategic discretionary investments; directed the Department of General Services to minimize the State government's carbon footprint by, among other things, promoting zero-emission vehicles in government fleets and managing State buildings' energy consumptions; and directed CARB to accelerate California's efforts toward achieving 5 million zero-emission vehicle sales by 2030.

EOs apply to State government but do not apply to other entities.

Legislative GHG Reduction Targets

The State has passed legislation that establishes a broad framework for the long-term GHG reduction and climate change adaptation programs. The following are the primary laws related to GHG reduction targets that are also relevant to California's energy goals.

- **Assembly Bill (AB) 32, Health & Safety Code Section 38500 et seq.** Codified the 2020 reduction target of EO S-03-05 (i.e., by 2020, reach the GHG emissions levels of 1990). AB 32 also gave CARB authority to develop a Scoping Plan that describes the approach California will take to achieve GHG reduction targets.
- **Senate Bill (SB) 32, Health & Safety Code Section 38566.** Codified the 2030 reduction target of EO B-30-15 (i.e., by 2030, reach statewide GHG emission levels of 40 percent below 1990 levels). As part of SB 32, AB 197 of 2016 (Chapter 250, Statutes of 2016) required CARB, in implementing SB 32's 2030 GHG reduction target, to (1) prioritize emissions reductions to consider the "social costs" of GHG emissions and (2) prioritize "direct emission reductions" at large stationary sources and at mobile sources. In 2017, CARB updated the Scoping Plan to achieve the 2030 reduction target.

State Agency GHG Reduction Plans

CARB and other State agencies have adopted various GHG reduction plans. A description of these plans follows. These are discussed in further detail in Section 4.8.

- **AB 32 Scoping Plan.** Identifies specific measures to reduce GHG emissions to 1990 levels by 2020 and requires CARB and other State agencies to develop and enforce regulations and other initiatives to reduce GHG emissions. The AB 32 Scoping Plan, first adopted in 2008, comprises the state's roadmap for meeting AB 32's reduction target. Specifically, the scoping plan articulates a key role for local governments by recommending that they establish GHG emissions-reduction goals for both their municipal operations and the community that are consistent with those of the State (i.e., approximately 15 percent below current levels) (CARB 2008). The AB 32 Scoping Plan was updated in 2014.
- **2017 Scoping Plan.** Represents the state's roadmap to achieving long-term GHG reduction target of SB 32. As energy is one of the state's largest contributors to GHG emissions, efforts to reduce energy-related emissions are a key component of the Scoping Plan. The actions outlined in the Scoping Plan Update also support California's efforts to build a state-of-the-art energy generation, supply and distribution system that is clean, affordable and reliable. The Scoping Plan Update references a 2013 study by the California Energy Commission (CEC) that shows 12 percent of the total energy used in the state is related to water, with 10 percent associated with water-related end uses (e.g., heating, cooling, pressurizing, and industrial processes) and 2 percent associated with energy used by water and wastewater systems (e.g., pump,

convey, treat). These figures indicate that the greatest potential for water-related energy savings resides with water end users, while water agencies have a role in improving end-user water conservation and in reducing the energy intensity of their portfolios. SB 350 and other regulations are expected to decarbonize the electricity sector over time, which will in turn reduce the consumption of fossil-fuel-based energy to produce water (CARB 2017).

Transportation Planning

- **SB 375, Chapter 728, Statutes of 2008.** Provides for a new planning process that integrates regional transportation, land use, GHG reduction, and housing planning. SB 375 requires regional transportation plans (RTPs) to incorporate a sustainable communities strategy (SCS) that demonstrates how the region would achieve regional GHG emission reduction targets for passenger vehicles set by CARB. CARB revised SANDAG's GHG targets in 2018 to 15 percent reduction in emissions per capita by 2020 and 19 percent by 2035 based on a 2005 baseline.

  In November 2018, CARB released the 2018 Progress Report on California's Sustainable Communities and Climate Protection Act to evaluate the performance of the SCSs prepared pursuant to the first set of reduction targets established by SB 375. The 2018 Progress Report, issued pursuant to SB 150 (Chapter 646, Statutes of 2017), found that Metropolitan Planning Organizations (MPOs) are not on track to meet the GHG reductions expected under SB 375 for 2020 due to an overall increase in statewide VMT per capita. While the state is expected to meet its overall 2020 target due to reductions achieved in the energy sector, the 2018 Progress Report concluded that additional VMT reductions will be needed to meet longer-term State GHG reductions targets for 2030 and 2050 (CARB 2018a).

  Under SB 375, CARB must agree that SCSs are able to meet GHG reduction targets. For this purpose, in September 2019, CARB published updated SCS Program and Evaluation Guidelines (CARB 2019a).

Fuel Economy Standards

- **Advanced Clean Cars Program (Passenger Vehicles).** AB 1493 of 2002 (known as Pavley I, Chapter 200, Statutes of 2002) provided the nation's first GHG standards for automobiles. AB 1493 required CARB to adopt vehicle standards that lowered GHG emissions from new light-duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (referred to previously as Pavley II and now referred to as the Advanced Clean Cars Measure Program's Low Emission Vehicle [LEV] III Regulation) was adopted for vehicle model years 2017–2025 in 2012 (13 California Code of Regulations Section 1900 et seq.).

  The SAFE Vehicle Rule Part One (discussed above) revokes California's authority to set its own GHG emissions standards and establish zero-emission vehicle (ZEV) mandates in California, which affects some of the underlying assumptions in CARB's EMFAC models. CARB staff has developed guidance and adjustment factors that need to be applied to EMFAC emissions outputs to adjust for the revised (reduced) ZEV sales in future years and associated increase in emissions.

- **Low Carbon Fuel Standard.** Pursuant to EO S-01-07 and AB 32, CARB developed the Low Carbon Fuel Standard (LCFS) in order to encourage the use of cleaner low-carbon fuels in California, encourage the production of those cleaner fuels, and thereby reduce GHG emissions. The program is based on the principle that each fuel has "life cycle" GHG emissions that includes the production, transportation, and consumption of a given fuel. Each fuel is assigned a carbon intensity score, which is then compared to a declining carbon intensity benchmark for each year. Low carbon fuels below the benchmark generate credits, while fuels above the carbon intensity benchmark generate deficits. Credits and deficits are denominated in metric tons of GHG emissions. Providers of transportation fuels must demonstrate that the mix of fuels they supply for use in California meets the LCFS carbon intensity standards, or benchmarks,

for each annual compliance period. A deficit generator meets its compliance obligation by ensuring that the amount of credits it earns or otherwise acquires from another party is equal to, or greater than, the deficits it has incurred.

- **Medium and Heavy Duty Vehicles.** In December 2008, CARB adopted a new regulation aimed at reducing GHG emissions by improving the fuel efficiency of heavy-duty tractors pulling 53-foot or longer trailers. Increases in fuel efficiency were achieved through improvements in the aerodynamics of the tractor and trailer as well as the use of low rolling resistance tires. The rule went into effect in 2010 and by the end of 2020 was anticipated to have reduced diesel fuel consumption by 500 million gallons in California and 3.3 billion gallons nationwide.

Electric Vehicles

CARB has three different types of ZEV programs: regulatory, incentive, and supporting. As of July 2019, CARB has 28 ZEV programs either in place or under development (CARB 2019b). Key programs are described below.

- **Executive Order B-16-12 (2012).** EO B-16-12 orders State entities under the direction of the Governor, including CARB, the CEC, and the California Public Utilities Commission (CPUC), to support the rapid commercialization of ZEVs. It directs these entities to achieve various benchmarks related to ZEVs.
- **EO B-48-18 (2018).** Sets goals to boost the use of ZEVs, EV charging infrastructure, and hydrogen refueling infrastructure in California. The order will implement the target of 5 million ZEVs on the road by 2030 and 250,000 vehicle charging stations and 200 hydrogen refueling stations by 2025.
- **Zero Emission Vehicle Regulation, 1s California Code of Regulations (CCR) Section 1962 et seq.** Requires manufacturers to sell an increasing number of ZEVs over time. Manufacturers are required to produce a number of ZEVs and plug-in hybrids each year, based on the total number of cars sold in California by the manufacturer. Manufacturers with higher overall sales of all vehicles are required to make more ZEVs. Requirements are in terms of percent credits, ranging from 4.5 percent in 2018 to 22 percent by 2025. Manufacturers are to produce vehicles, and each vehicle receives credits based on its electric driving range. The more range a vehicle has, the more credit it receives. CARB's goal is for a minimum of approximately 1 million ZEVs to be on the road by 2025 based on this regulation. EO B-16-12 calls for 1.5 million ZEVs by 2025 (CARB 2018b).

Renewable Energy

- **Renewables Portfolio Standard.** Earlier legislation established California's RPS. The program sets continuously escalating renewable energy procurement requirements for the state's load-serving entities. Generation must be procured from RPS-certified facilities. SB 2 (1X) of 2011 obligated all California electricity providers to obtain at least 33 percent of their energy from renewable resources by 2020. The CPUC and CEC are jointly responsible for implementing the program.
- **SB 350 (Chapter 547, Statutes of 2015)**. This bill's key provisions are to require the following by 2030: (1) an RPS of 50 percent and (2) a doubling of efficiency for existing buildings.
- **SB 100 (Chapter 312, Statutes of 2018)**. This bill establishes a new RPS target of 50 percent by 2026, increases the RPS target in 2030 from 50 to 60 percent, and establishes a goal of 100 percent zero-carbon energy sources by 2045.

Building Efficiency

- **California Building Energy Efficiency Standards.** The energy consumption of new residential and nonresidential buildings in California is regulated by the Title 24, Part 6, Building Energy Efficiency

Standards (California Energy Code). CEC updates the California Energy Code every 3 years with more stringent design requirements for reduced energy consumption, which results in the generation of fewer GHG emissions. The 2016 California Energy Code was replaced by the 2019 standards, effective January 1, 2020. The 2019 California Energy Code require builders to use more energy-efficient building technologies for compliance with increased restrictions on allowable energy use. Additionally, new residential units will be required to include solar panels, sized to offset the estimated electrical requirements of each unit (24 CCR Part 6, Section 150.1[c]14).

- **California Green Building Standards Code.** California has adopted the Green Building Standards Code (CALGreen) (24 CCR Part 11), which identifies aggressive energy efficiency standards for new residential and non-residential buildings that are continuously updated every few years. The most recent update was the 2019 Building Energy Efficiency Standards, which were adopted in May 2018 and took effect on January 1, 2020. Non-residential buildings will be 30 percent more energy efficient due to the update in HVAC, ventilation, and lighting standards. CALGreen requirements are complementary with the California Energy Code discussed above.

California Energy Commission

- **Warren-Alquist Act (1974).** Passed in 1974 in order to establish the CEC to respond to the energy crisis in the early 1970s and to address the state's unsustainable growing demand for energy resources. The CEC's Chief Counsel's Office publishes updated versions of the Warren-Alquist Act with the latest amendments every 2 years. The most recent version was published in January 2020.
- **Senate Bill 1389, Chapter 568, Statutes of 2002.** The CEC is responsible for, among other things, forecasting future energy needs for the state and developing renewable energy resources and alternative renewable energy technologies for buildings, industry, and transportation. SB 1389 (Chapter 568, Statutes of 2002) requires the CEC to prepare a biennial integrated energy policy report assessing major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors. The report also provides policy recommendations to conserve resources, protect the environment, and ensure reliable, secure, and diverse energy supplies. The 2020 Integrated Energy Policy Report was adopted in March 2021. Energy topics covered in the report include decarbonizing buildings, integrating renewables, energy efficiency, energy equity, integrating renewable energy, updates on Southern California electricity reliability, climate adaptation activities for the energy sector, natural gas assessment, transportation energy demand forecast, and the California Energy Demand Forecast (CEC 2021).

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

San Diego Association of Governments Climate Action Strategy

In 2010, SANDAG published a Climate Action Strategy (Strategy) that was prepared under a partnership with the CEC (SANDAG 2010). The Strategy is a guidance document and not a binding plan. The Strategy serves as a guide to help policymakers address climate change as they make decisions to meet the needs of our growing population, maintain and enhance our quality of life, and promote economic stability. As stated in the Strategy introduction, the policy measures contained in the Strategy are intended to be a list of potential options (tools in the toolbox) for consideration as SANDAG and local governments update their various plans. The policy measures are not requirements for SANDAG, local governments, or any other entity.

The Strategy identifies goals, objectives, and policy measures in the areas of transportation, land use, buildings, and energy use. Energy measures pertained to reducing direct and water-related energy use in residential and commercial buildings, increasing renewable energy capacity, and protecting energy infrastructure from climate change impacts. Also addressed are measures and resources to help local governments reduce

emissions from their operations and in their communities. The policy measures contained in this document are intended to be a list of potential options to reduce GHG emissions. Because local governments have greater control over some categories of GHG emission sources, the Strategy emphasizes those areas where the greatest impact can be made at the local and regional level. These areas include land use patterns, transportation infrastructure, and related public investment; building construction and energy use; and local government operations.

SANDAG Regional Energy Strategy

The Regional Energy Strategy (RES) serves as an energy policy guide to support decision-making by SANDAG and its member agencies. The 2014 RES updates SANDAG energy strategies adopted in 1994, 2003, and 2009. The RES is structured around 11 major energy topics, such as energy efficiency and conservation, renewable energy, transportation fuels, and land use and transportation planning (SANDAG 2014b).

Regional Alternative Fuel Planning

In 2009, SANDAG developed the *Regional Alternative Fuels, Vehicles and Infrastructure Report*, which is an assessment on how to accelerate deployment of alternative fuel vehicles in and around San Diego. The objectives of the report are to (1) help local governments and other regional stakeholders make informed decisions regarding appropriate alternative fuel technologies, and (2) identify and recommend regional and local government actions that can initially support local alternative fuel fleets and eventually support alternative fuel use by the general public. The report also includes recommendations for alternative fuels and project types. Electricity and natural gas are the top priorities for passenger vehicles, while biodiesel, natural gas, propane, and hybrid technologies are recommended for medium- and heavy-duty vehicles. The report recommends further study of transit stations along rapid bus transit routes, integrating electric charging station siting with the regional transportation network, and truck stop electrification (SANDAG 2009a).

San Diego Regional Plug-In Electric Vehicle Readiness Plan and Plug-In San Diego

In 2012, SANDAG established the San Diego Regional Electric Vehicle Infrastructure Working Group (REVI) as part of a CEC grant to perform regional Plug-In Electric Vehicle (PEV) readiness planning. The REVI completed the San Diego Regional Plug-in Electric Vehicle Readiness Plan, which was accepted by the SANDAG Board in January 2014 (SANDAG 2014a). As part of another CEC grant, SANDAG will build on the success of the REVI and undertake regional readiness planning for all alternative fuels in partnership with the San Diego Regional Clean Cities Coalition. A regional alternative fuels coordinating council will be established to advise on regional alternative fuel infrastructure needs, barriers, and solutions.

With additional funding from the CEC, SANDAG transitioned from readiness planning to implementation via the Plug-in SD initiative. The initiative is a combination of resource development, training, technical assistance, and outreach. See Section 4.8 for further details.

SANDAG Energy Roadmap Program for Local Governments

SANDAG and SDG&E provide free energy assessments and energy management plans to SANDAG member agencies. This Energy Roadmap Program was established in 2010 and provides a framework for local governments to reduce energy use. The goals of the program include categories such as saving energy in city buildings and facilities, demonstrating emerging energy technologies, and greening the city vehicle fleet. SANDAG assists member agencies in developing projects and programs to reduce government spending on utility bills and integrate sustainability, energy efficiency, and emission reductions into general plans.

Local General Plans

Many of the local agencies in the San Diego region have general plan goals, objectives, and policies that specifically address energy use and conservation. The policies set forth in local general plans would have an effect on energy conservation and renewable energy use in the development of new structures and communities within the proposed Plan Area.

These goals and policies include improvements in energy efficiency for new residential and commercial land uses and measures to reduce VMT through land use and transportation planning. Measures included in the general plans would improve energy efficiency, promote renewable energy use, and minimize wasteful, inefficient energy consumption in the proposed Plan Area. As a result of requirements, incentive programs, and educational and outreach programs, general plans would build on federal and State efforts to improve energy efficiency associated with future land uses and transportation projects.

Climate Action Plans

As discussed in more detail in Section 4.8, Climate Action Plans (CAPs), GHG reduction plans, and/or sustainability plans are developed to identify the nature of GHG emissions and to implement policies, actions, and measures to reduce existing and future GHG emissions. Measures included in CAPs would improve energy efficiency, promote renewable energy use, and minimize wasteful, inefficient energy consumption in the proposed Plan Area.

Many jurisdictions have already adopted GHG reduction plans: City of Carlsbad (2020), Chula Vista (2017), City of Del Mar (2016), City of El Cajon (2020), City of Encinitas (2020), City of Escondido (2021), City of La Mesa (2018), City of Lemon Grove (2020), City of National City (2011), City of Oceanside (2019), City of San Diego (2015), City of San Marcos (2020), City of Santee (2019), City of Solana Beach (2017), and City of Vista (2021). The City of Coronado and the County of San Diego are developing CAPs or GHG reduction plans. The City of Poway is the only jurisdiction within the San Diego region that has not developed and has not committed to developing a CAP or GHG reduction plan. Table 4.8-5 in Section 4.8 summarizes GHG reduction planning efforts within the San Diego region. In addition to the efforts of the 18 cities and the County of San Diego, the San Diego Unified Port District and the San Diego County Water Authority have developed GHG inventories and CAPs.

Local Community Choice Energy Programs

The cities of Chula Vista, Encinitas, Imperial Beach, La Mesa, and San Diego formed the SDCP CCE Program, which started delivering power to municipal customers in March 2021. In June 2021 SDCP started providing service to commercial customers, and service to residential customers is anticipated to begin in early 2022. Once fully launched, SDCP will provide electricity service to approximately 770,000 customer accounts. SDCP plans to deliver 55 percent GHG-free electricity in 2021 and supply 100 percent renewable electricity by 2030 or 2035 (SDCP 2021, CalCCA 2021).

Additionally, the cities of Carlsbad, Del Mar, and Solana Beach have formed the CEA, another CCE Program, started delivering power to customers in May 2021. SDCP and CEA work in partnership with San Diego Gas & Electric to deliver GHG-efficient electricity to customers within its member jurisdictions.

4.6.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the Appendix G checklist questions.

Checklist questions for energy are provided in Section VI of Appendix G of the CEQA Guidelines. Checklist items were not modified for this analysis. Therefore, implementation of the proposed Plan would have a significant energy impact if it would:

EN-1 Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy during project construction or operations.

EN-2 Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.6.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

EN-1 RESULT IN A POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACT DUE TO WASTEFUL, INEFFICIENT, OR UNNECESSARY CONSUMPTION OF ENERGY DURING PROJECT CONSTRUCTION OR OPERATIONS

ANALYSIS METHODOLOGY

This section discusses the construction and operation impacts related to energy from regional growth and land use change, and planned transportation network improvements.

Construction

Construction activities would occur through 2050 at various locations throughout the proposed Plan Area. While the regional GHG inventory (see Appendix F of this EIR) did not provide a direct estimate of construction energy consumption, several typical construction energy sources were indirectly captured.

1. Energy consumption from the construction and mining subcategory of the off-road transportation sector of the GHG inventory are used to estimate energy consumed by construction equipment.[5]
2. Energy consumption estimates for on-road construction vehicles and worker commute vehicles are included in operational estimates for transportation network improvements and programs.
3. The use of electricity for temporary buildings, lighting, and other sources is estimated as part of operational energy consumption for regional growth and land use change.

The location, size, magnitude, and duration of construction activities within the proposed Plan Area due to Plan implementation is unknown at this time. However, construction activities, as compared to operational energy demand, would be short term in nature. Construction energy use related to on-road vehicles and electricity are calculated as part of the operational analysis, as further discussed below. Construction energy use related to

[5] The construction/mining subcategory includes construction equipment, as well as mining equipment not directly related to construction activities. Therefore, the use of the construction/mining subcategory likely overestimates the amount of fuel consumption that would result from construction activities associated with the proposed Plan.

off-road equipment is summed to calculate total and per capita annual energy use and analyzed as part of the operational analysis.

Operation

Estimates of baseline and projected operational energy consumption that were developed as part of the regional GHG inventory were used for the analysis of regional growth and land use change (see Appendix F to this EIR). The following operational energy sources related to regional growth and land use change were quantified as part of this analysis.

- **Electricity and Natural Gas.** Electricity (GWh) and natural gas (million therms) used by regional land uses (commercial, residential, industrial) for heating, cooling, lighting, and other end uses.
- **Water-related Electricity.** Water-related electricity (GWh) refers to energy associated with upstream supply and conveyance, and treatment of water. Electricity used for water distribution and water end-use is captured by the building end use electricity and natural gas source.

Operational energy use for baseline and projected transportation network improvements and programs was estimated as part of the regional GHG inventory (see Appendix F to this EIR). The following operational energy sources related to transportation network improvements and programs were quantified as part of this analysis.

- **On-Road Vehicle Gasoline and Diesel.** Gasoline and diesel fuel consumption (million gallons) associated with operation of the transportation network, including passenger cars, light-duty trucks, medium- and heavy-duty trucks, and buses.
- **Rail Diesel**. Includes combustion of diesel fuels in internal combustion engines from both passenger and freight rail.

There were several GHG emission sources included in the regional GHG inventory (see Appendix F to this EIR) that have energy consumption associated with them but for which there was no activity data provided in the inventory that could be used to back out energy consumption values.

- **Other fuels**. Includes distillate, kerosene, gasoline, liquefied petroleum gas, residual fuel oil, and wood.
- **Off-road transportation.** Includes fuel consumption cargo handling equipment, industrial equipment, airport ground support, pleasure craft, recreational equipment, lawn and garden equipment, agricultural equipment, transport refrigeration units, military tactical support equipment, and other portable equipment. Note that the construction/mining subcategory was used as a proxy for construction equipment energy.
- **Aviation.** Includes jet fuel and aviation gasoline consumption from commercial operations at the San Diego International Airport and McClellan-Palomar Airport.
- **Marine vessels**. Includes fuel consumption by ocean-going vessels and commercial harbor craft, largely attributed to the Port of San Diego.

These sources would result in additional baseline and horizon year energy consumption not captured by the quantified energy consumption provided in this analysis. According to the regional GHG inventory, these sources account for less than 10 percent of the proposed Plan's total GHG emissions (see Appendix F to this EIR). Assuming the emission ratios between sectors are similar to the energy ratios between sectors (e.g., vehicles and building energy account for the majority of activity), these sources would only account for a minor fraction of the proposed Plan's energy use. This small additional energy is therefore not discussed further in the impact analysis.

The determination of whether implementing transportation projects and land use changes reflected in the proposed Plan would result in wasteful or unnecessary energy consumption is based on whether the proposed Plan would result in a decrease in per capita energy consumption. Consistent with Appendix F to the CEQA Guidelines, a per capita analysis is appropriate for the proposed Plan, as that analysis would determine whether the energy use under the proposed Plan is more efficient relative to the 2016 baseline year. The analysis combines electricity (GWh), natural gas (million therms), on-road vehicle fuel consumption (million gallons), and construction equipment diesel consumption (million gallons) into a common unit of energy usage (trillion BTU). Energy consumption from all operational sources was quantified using industry standard emission and conversion factors. A full list of assumptions and energy calculations can be found in Appendix F to this EIR.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Construction

Construction related to growth and land use changes and planned transportation improvements would require the use of energy-consuming equipment for site preparation, grading, building assembly, and equipment installation. The transportation of workers and materials to and from project sites would require the consumption of diesel and gasoline fuels. Medium- and heavy-duty trucks and vans with Gross Vehicle Weight Ratings between 8,500 and 33,000 pounds would typically be used. Energy consumption estimates for on-road construction vehicles and worker commute vehicles are included in operational estimates for transportation network improvements and programs. Also, the use of electricity during construction for temporary buildings, lighting, and other sources is estimated as part of operational energy consumption for regional growth and land use change.

A wide variety of equipment powered through the combustion of liquid fuels may be used. Typical construction equipment would include pavers, trenchers, mixers, cranes, dumpers/tenders, excavators, graders, tractors, trucks, forklifts, dozers, loaders, and scrapers. Internal-combustion engines that consume diesel and gasoline typically power these types of equipment and can have outputs ranging from 5 to 750 horsepower. Off-road equipment with diesel engines of 25 horsepower or larger are regulated by CARB for purposes of emissions reductions (13 CCR Section 2449). These regulations require operators to limit idling during operation and to upgrade older equipment with modern engines, which additionally provides benefits for the reduction of fuel consumption.

Construction activities would occur over the duration of the proposed Plan at various locations throughout the proposed Plan Area. The location, size, magnitude, and duration of individual construction activities is unknown at this time. However, construction activities, as compared to operational energy demand, would be short term in nature. The significance determination regarding construction energy is grouped under *Operation* because both construction and operation energy are summed to a total and per capita annual energy consumption.

Operation

With respect to operations of the land use changes and planned transportation improvements, baseline energy consumption was calculated for 2016 and compared to years 2025, 2035, and 2050.

As shown in Table 4.6-1, total energy use would decrease under the proposed Plan for 2025 compared to the 2016 baseline year. During the same time, the regional population would increase. As a result of the total energy decrease and population increase, per capita energy use would decrease from 2016 to 2025.

The decrease in total and per capita energy use is due in part to regulations and programs implemented on the state and regional levels to reduce energy use and emissions of GHGs. These programs include Advanced Clean Cars regulations, the LCFS, energy efficiency standards for buildings, and water conservation measures. In addition, SANDAG's shared mobility strategies have an important role in reducing per capita energy use because they decrease per capita vehicle miles traveled and therefore fuel use. The mobility strategies that were quantified as part of this analysis include vanpool, carshare, pooled rides, and the transportation demand management ordinance.

Lastly, the majority of the housing growth under the proposed Plan would be multi-family development. Due to space efficiency, multi-family units are more efficient than single-family housing on a per unit basis in terms of electricity and natural gas consumption.

2025 Conclusion

Implementation of regional growth and land use change and transportation network improvements and programs would not result in an increase in overall per capita energy consumption, or otherwise use energy in an inefficient, wasteful, or unnecessary manner, because per capita energy use would decrease from 2016 to 2025. Therefore, this impact (EN-1) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

As shown in Table 4.6-1, total energy use would decrease under the proposed Plan from 2016 to 2035. During the same time, the regional population would increase. As a result of the total energy decrease and population increase, per capita energy use would decrease from 2016 to 2035. The decrease in total and per capita energy use is due in part to regulations and programs implemented on the state and regional levels to reduce energy use and emissions of GHGs. It is also due to the increase in multi-family development under the proposed Plan, as multi-family units are more energy efficient than single-family housing on a per unit basis in terms of electricity and natural gas consumption.

2035 Conclusion

Implementation of regional growth and land use change and transportation network improvements and programs would not result in an increase in overall per capita energy consumption, or otherwise use energy in an inefficient, wasteful, or unnecessary manner, because per capita energy use would decrease from 2016 to 2035. Therefore, this impact (EN-1) in the year 2035 is less than significant.

Table 4.6-1
Total and per Capita Energy Use Under the Proposed Plan: 2016 and 2025, 2035, 2050

Category	2016 (Baseline)		2025		2035		2050	
	Energy Use	Trillion BTU	Energy Use	Trillion BTU	Energy Use	Trillion BTU	Energy Use	Trillion BTU
Regional Growth and Land Use Change	--	123	--	122	--	126	--	129
Electricity (GWh)	18,842	64	17,475	60	18,078	62	18,191	62
Natural Gas (million therms)	585	59	629	63	648	65	671	67
Transportation Network Improvements and Programs	--	16~~7~~8	--	13~~2~~3	--	11~~1~~3	--	10~~9~~12
Vehicles, Gasoline (million gallons)	1,23~~4~~4~~7~~	1~~4~~8~~5~~0	93~~2~~7	11~~2~~3	7~~5~~0~~6~~4	9~~0~~2	72~~3~~3~~9~~	8~~7~~9
Vehicles, Diesel (million gallons)	12~~2~~3	17	13~~0~~2	18	13~~2~~5	1~~8~~9	14~~3~~5	20
Rail, Diesel (million gallons)	11	1	16	2	18	3	19	3
Total Construction (million gallons)	20	3	24	3	29	4	34	5
Total Energy Use	--	29~~2~~4	--	25~~8~~9	--	24~~1~~3	--	24~~3~~5
Per Capita Energy Use (metric million BTU/person)	89		7~~4~~5		67		65	
Total Energy Use, Percent Change 2016 to Plan Year	**--**		**-12%**		**-17%**		**-17%**	
Per Capita Energy Use, Percent Change 2016 to Plan Year	**--**		**-1~~6~~7%**		**-25%**		**-27%**	

Source: Appendix F
Notes:
2016 population = 3,287,280; 2025 population = 3,470,848; 2035 population = 3,620,348; 2050 population = 3,746,073.
Numbers are rounded off and may not add up to the stated totals.
1 kWh = 3,412 BTU; 1 therm = 99,976 BTU; 1 gallon, gasoline = 120,286 BTU; 1 gallon, diesel = 137,381 BTU.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

As shown in Table 4.6-1, total energy use would decrease under the proposed Plan from 2016 to 2050. During the same time, the regional population would increase. As a result of the total energy decrease and population increase, per capita energy use would decrease from 2016 to 2050. The decrease in total and per capita energy use is due in part to regulations and programs implemented on the state and regional levels to reduce energy use and emissions of GHGs. It is also due to the increase in multi-family development under the proposed Plan, as multi-family units are more energy efficient than single-family housing on a per unit basis in terms of electricity and natural gas consumption.

2050 Conclusion

Implementation of regional growth and land use change and transportation network improvements and programs would not result in an increase in overall per capita energy consumption, or otherwise use energy in an inefficient, wasteful, or unnecessary manner, because per capita energy use would decrease from 2016 to 2050. Therefore, this impact (EN-1) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

The proposed Plan could potentially exacerbate climate change effects on inefficient energy use. The proposed Plan intends to result in a substantial increase in energy efficiency through land use planning strategies and transportation network improvements; this improved energy efficiency would achieve a decrease in per capita energy use even as the proposed Plan results in increasing population, employment, and housing growth. However, climate change may result in an increased demand for energy on a per capita basis; for example, projected hotter temperatures in the San Diego region may incentivize people to use air conditioning more often. This could result in a smaller decrease in per capita energy use than projected. In this case, the proposed Plan would exacerbate the increased demand for energy caused by climate change by stimulating population and housing growth (Moser et al. 2012).

EN-2 CONFLICT WITH OR OBSTRUCT A STATE OR LOCAL PLAN FOR RENEWABLE ENERGY OR ENERGY EFFICIENCY

ANALYSIS METHODOLOGY

This analysis evaluates whether implementation of the proposed Plan would obstruct State and local renewable energy and energy efficiency plans, regulations, and policies, discussed above in Section 4.6.2, *Regulatory Setting.* The applicable State and local plans that address renewable energy and energy efficiency are the Warren Alquist Act, Requirements for In-Use Off-Road Diesel-Fueled Fleets, Advanced Clean Cars regulations, the LCFS, CalGreen, the California Energy Code, SB 100, local CAPs, and applicable sections of general plans. The proposed Plan is required to comply with these State and local plans and regulations, all of which are aimed at increasing energy efficiency and renewable energy development. The discussion below further examines consistency with adopted plans and policies related to energy conservation.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Implementation of the proposed Plan's regional growth and land use changes would not conflict with or obstruct State or local plans for increasing energy efficiency, including the Warren-Alquist Act, CalGreen, local CAPs, and applicable sections of local general plans. The Warren-Alquist Act established a State policy to reduce wasteful, uneconomical and unnecessary uses of energy. As shown in Table 4.6-1, total electricity consumption would decrease between 2016 and 2025. As explained in the impact analysis of EN-1, the proposed Plan would not result in wasteful, inefficient, or unnecessary use of energy. Therefore, the proposed Plan is consistent with the Warren-Alquist Act policies. CalGreen includes specific requirements related to recycling, construction materials and energy efficiency standards, which would apply to construction of land use projects, which would help to minimize waste and energy consumption. The land uses constructed under the proposed Plan would also be subject to the energy and GHG reduction policies of a general plan and CAP, if applicable. Many local general plans and CAPs include policies that encourage the energy conservation and energy efficiency in new buildings. The projected land use pattern included in the proposed Plan would not conflict with the applicability of those plans and policies to future development within the proposed Plan Area.

Implementation of the proposed Plan's regional growth and land use changes would not conflict with or obstruct State and local plans for increasing renewable energy, including the California Energy Code, SB 100, local CAPs, and applicable sections of local general plans. The projected land use pattern would be subject to the most recent iteration of the California Energy Code, which requires that single-family residential development include solar photovoltaics. Future land uses would also be required to adhere to future iterations of the California Energy Code, which is updated every 3 years and is expected to become increasingly more stringent over time to further the state's renewable energy and GHG reduction goals. The percent of renewable or GHG-free electricity provided in the region would increase from 2016 through 2025 based on the SB 100 RPS targets, resulting in a reduction in use of nonrenewable energy resources. The land uses constructed under the proposed Plan would also be subject to the renewable energy policies of a general plan and CAP, if applicable. The projected land use pattern included in the proposed Plan would not conflict with the applicability of those policies to future development within the proposed Plan Area. Thus, the proposed Plan's regional growth and land use changes would not conflict with or obstruct a State or local plan for increasing renewable energy or energy efficiency.

Transportation Network Improvements and Programs

Implementation of the proposed Plan's transportation network improvements and programs would not conflict with or obstruct State and local plans for increasing energy efficiency, including the Warrin-Alquist Act, the Requirements for In-Use Off-Road Diesel-Fueled Fleets, and Advanced Clean Cars regulations. As discussed above, the Warren-Alquist Act established a State policy to reduce wasteful, uneconomical and unnecessary uses of energy. As shown in Table 4.6-1, total gasoline consumption, the primary on-road vehicle fuel in the region, would decrease between 2016 and 2025. As explained in the impact analysis of EN-1, the proposed Plan would not result in wasteful, inefficient, or unnecessary use of energy. Therefore, the proposed Plan is consistent with the Warren-Alquist Act policies. In addition, off-road equipment with diesel engines of 25 horsepower or larger are regulated by CARB for purposes of emissions reductions under the Requirements for In-Use Off-Road Diesel-Fueled Fleets. These regulations require operators to limit idling during operation and to upgrade older equipment with modern engines, which additionally provides benefits for the reduction of

fuel consumption. On-road vehicle fuel consumption would be propelled by compliance with the Advances Clean Cars regulations, which would increasingly limit the use of nonrenewable fuel sources by requiring vehicle manufacturers to produce an increasing number of ZEVs.

Implementation of the proposed Plan's transportation network improvements and programs would also not conflict with or obstruct State and local plan for increasing renewable energy, including the LCFS and local general plans and CAPs. The LCFS is designed to decrease the carbon intensity of California's transportation fuel pool and provide an increasing range of low-carbon and renewable alternatives, which reduces petroleum dependency and encourages the use of cleaner low-carbon transportation fuels (e.g., hydrogen, electricity, biofuels). In addition, City and County policies determined in their general plans and CAPs to improve the region's EV infrastructure would continue to apply with implementation of the proposed Plan. Thus, the planned transportation network improvements in the proposed Plan would not conflict with a State or regional plan related to the increased use of renewable energy or energy efficiency.

2025 Conclusion

Regional growth and land use change and transportation network improvements and programs would not conflict with or obstruct a State or regional plan related to the increased use of renewable energy or energy efficiency. Therefore, this impact (EN-2) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change

Similar to the analysis of Impact EN-2 for the year 2025, implementation of the proposed Plan's regional growth and land use changes through 2035 would not conflict with or obstruct State or local plans for increasing energy efficiency, including the Warren-Alquist Act, CalGreen, local CAPs, and applicable sections of local general plans. The Warren-Alquist Act established a State policy to reduce wasteful, uneconomical and unnecessary uses of energy. As shown in Table 4.6-1, total electricity consumption would decrease between 2016 and 2035. As explained in the impact analysis of EN-1, the proposed Plan would not result in wasteful, inefficient, or unnecessary use of energy. Therefore, the proposed Plan is consistent with the Warren-Alquist Act policies. CalGreen includes specific requirements related to recycling, construction materials and energy efficiency standards, which would apply to construction of land use projects, which would help to minimize waste and energy consumption. The land uses constructed under the proposed Plan would also be subject to the energy and GHG reduction policies of a general plan and CAP, if applicable. Many local general plans and CAPs include policies that encourage the energy conservation and energy efficiency in new buildings. The projected land use pattern included in the proposed Plan would not conflict with the applicability of those plans and policies to future development within the proposed Plan Area.

Implementation of the proposed Plan's regional growth and land use changes would not conflict with or obstruct State and local plans for increasing renewable energy, including the California Energy Code, SB 100, local CAPs, and applicable sections of local general plans. The projected land use pattern would be subject to the most recent iteration of the California Energy Code, which requires that single-family residential development include solar photovoltaics. Future land uses would also be required to adhere to future iterations of the California Energy Code, which is updated every 3 years and is expected to become increasingly more stringent over time to further the state's renewable energy and GHG reduction goals. The percent of renewable or GHG-free electricity provided in the region would increase from 2016 through 2035 based on the SB 100 RPS targets, resulting in a reduction in use of nonrenewable energy resources. The land uses constructed under

the proposed Plan would also be subject to the renewable energy policies of a general plan and CAP, if applicable. The projected land use pattern included in the proposed Plan would not conflict with the applicability of those policies to future development within the proposed Plan Area. Thus, the proposed Plan's regional growth and land use changes would not conflict with or obstruct a State or local plan for increasing renewable energy or energy efficiency.

Transportation Network Improvements and Programs

Similar to the analysis of Impact EN-2 for the year 2025, implementation of the proposed Plan's transportation network improvements and programs through 2035 would not conflict with or obstruct State and local plans for increasing energy efficiency, including the Warrin-Alquist Act, the Requirements for In-Use Off-Road Diesel-Fueled Fleets, and Advanced Clean Cars regulations. As discussed above, the Warren-Alquist Act established a State policy to reduce wasteful, uneconomical and unnecessary uses of energy. As shown in Table 4.6-1, total gasoline consumption, the primary on-road vehicle fuel in the region, would decrease between 2016 and 2035. As explained in the impact analysis of EN-1, the proposed Plan would not result in wasteful, inefficient, or unnecessary use of energy. Therefore, the proposed Plan is consistent with the Warren-Alquist Act policies. In addition, off-road equipment with diesel engines of 25 horsepower or larger are regulated by CARB for purposes of emissions reductions under the Requirements for In-Use Off-Road Diesel-Fueled Fleets. These regulations require operators to limit idling during operation and to upgrade older equipment with modern engines, which additionally provides benefits for the reduction of fuel consumption. On-road vehicle fuel consumption would be propelled by compliance with the Advances Clean Cars regulations, which would increasingly limit the use of nonrenewable fuel sources by requiring vehicle manufacturers to produce an increasing number of ZEVs.

Implementation of the proposed Plan's transportation network improvements and programs would also not conflict with or obstruct State and local plan for increasing renewable energy, including the LCFS and local general plans and CAPs. The LCFS is designed to decrease the carbon intensity of California's transportation fuel pool and provide an increasing range of low-carbon and renewable alternatives, which reduces petroleum dependency and encourages the use of cleaner low-carbon transportation fuels (e.g., hydrogen, electricity, biofuels). In addition, City and County policies determined in their general plans and CAPs to improve the region's EV infrastructure would continue to apply with implementation of the proposed Plan. Thus, the planned transportation network improvements in the proposed Plan would not conflict with a State or regional plan related to the increased use of renewable energy or energy efficiency.

2035 Conclusion

Regional growth and land use change and transportation network improvements and programs would not conflict with or obstruct a State or regional plan related to the increased use of renewable energy or energy efficiency. Therefore, this impact (EN-2) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change

Similar to the analysis of Impact EN-2 for the year 2025 and 2035, implementation of the proposed Plan's regional growth and land use changes through 2050 would not conflict with or obstruct State or local plans for increasing energy efficiency, including the Warren-Alquist Act, CalGreen, local CAPs, and applicable sections of local general plans. The Warren-Alquist Act established a State policy to reduce wasteful, uneconomical and

unnecessary uses of energy. As shown in Table 4.6-1, total electricity consumption would decrease between 2016 and 2050. As explained in the impact analysis of EN-1, the proposed Plan would not result in wasteful, inefficient, or unnecessary use of energy. Therefore, the proposed Plan is consistent with the Warren-Alquist Act policies. CalGreen includes specific requirements related to recycling, construction materials and energy efficiency standards, which would apply to construction of land use projects, which would help to minimize waste and energy consumption. The land uses constructed under the proposed Plan would also be subject to the energy and GHG reduction policies of a general plan and CAP, if applicable. Many local general plans and CAPs include policies that encourage the energy conservation and energy efficiency in new buildings. The projected land use pattern included in the proposed Plan would not conflict with the applicability of those plans and policies to future development within the proposed Plan Area.

Implementation of the proposed Plan's regional growth and land use changes would not conflict with or obstruct State and local plans for increasing renewable energy, including the California Energy Code, SB 100, local CAPs, and applicable sections of local general plans. The projected land use pattern would be subject to the most recent iteration of the California Energy Code, which requires that single-family residential development include solar photovoltaics. Future land uses would also be required to adhere to future iterations of the California Energy Code, which is updated every 3 years and is expected to become increasingly more stringent over time to further the state's renewable energy and GHG reduction goals. The percent of renewable or GHG-free electricity provided in the region would reach 100 percent by 2050 based on the SB 100 RPS targets, resulting in a reduction in use of nonrenewable energy resources. The land uses constructed under the proposed Plan would also be subject to the renewable energy policies of a general plan and CAP, if applicable. existing CAPS currently do not extend to 2050, but renewable energy measures in these CAPs would likely continue beyond the CAP horizon years. The projected land use pattern included in the proposed Plan would not conflict with the applicability of those policies to future development within the proposed Plan Area. Thus, the proposed Plan's regional growth and land use changes would not conflict with or obstruct a State or local plan for increasing renewable energy or energy efficiency.

Transportation Network Improvements and Programs

Similar to the analysis of Impact EN-2 for the year 2025 and 2035, implementation of the proposed Plan's transportation network improvements and programs through 2050 would not conflict with or obstruct State and local plans for increasing energy efficiency, including the Warrin-Alquist Act, the Requirements for In-Use Off-Road Diesel-Fueled Fleets, and Advanced Clean Cars regulations. As discussed above, the Warren-Alquist Act established a State policy to reduce wasteful, uneconomical and unnecessary uses of energy. As shown in Table 4.6-1, total gasoline consumption, the primary on-road vehicle fuel in the region, would decrease between 2016 and 2050. As explained in the impact analysis of EN-1, the proposed Plan would not result in wasteful, inefficient, or unnecessary use of energy. Therefore, the proposed Plan is consistent with the Warren-Alquist Act policies. In addition, off-road equipment with diesel engines of 25 horsepower or larger are regulated by CARB for purposes of emissions reductions under the Requirements for In-Use Off-Road Diesel-Fueled Fleets. These regulations require operators to limit idling during operation and to upgrade older equipment with modern engines, which additionally provides benefits for the reduction of fuel consumption. On-road vehicle fuel consumption would be propelled by compliance with the Advances Clean Cars regulations, which would increasingly limit the use of nonrenewable fuel sources by requiring vehicle manufacturers to produce an increasing number of ZEVs.

Implementation of the proposed Plan's transportation network improvements and programs would also not conflict with or obstruct State and local plan for increasing renewable energy, including the LCFS and local general plans and CAPs. The LCFS is designed to decrease the carbon intensity of California's transportation

fuel pool and provide an increasing range of low-carbon and renewable alternatives, which reduces petroleum dependency and encourages the use of cleaner low-carbon transportation fuels (e.g., hydrogen, electricity, biofuels). In addition, City and County policies determined in their general plans and CAPs to improve the region's EV infrastructure would continue to apply with implementation of the proposed Plan. Thus, the planned transportation network improvements in the proposed Plan would not conflict with a State or regional plan related to the increased use of renewable energy or energy efficiency.

2050 Conclusion

Regional growth and land use change and transportation network improvements and programs would not conflict with or obstruct a State or regional plan related to the increased use of renewable energy or energy efficiency. Therefore, this impact (EN-2) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects that would conflict with or obstruct a State or regional plan related to the increased use of renewable energy or energy efficiency.

4.7 GEOLOGY, SOILS, AND PALEONTOLOGICAL RESOURCES

This section evaluates the geology, soils, and paleontological resources impacts of the proposed Plan.

4.7.1 EXISTING CONDITIONS

GEOLOGY AND SOILS

Geologic Conditions

The San Diego region lies across two California geomorphic provinces: (1) the Peninsular Ranges and (2) the Colorado Desert, which contains the Salton Trough. The majority of the region is in the Peninsular Ranges. The Peninsular Ranges encompass an area that roughly extends from the Transverse Ranges and the Los Angeles Basin, south to the Mexican border, and another approximately 800 miles to the tip of Baja California where it makes up the Baja California Peninsula (Harden 1998). Extending east of Julian and Jacumba, the Peninsular Ranges province abruptly ends along a series of faults. The geomorphic province varies in width from approximately 30 to 100 miles in the San Diego region, most of which is characterized by northwest-trending mountain ranges separated by subparallel fault zones. In general, the Peninsular Ranges are underlain by Jurassic-age metavolcanic and metasedimentary rocks and by Cretaceous-age igneous rocks of the southern California batholith. Geologic cover over the basement rocks in the westernmost portion of the province in the San Diego region generally consists of Upper Cretaceous-, Tertiary-, and Quaternary-age sedimentary rocks. (Figure 4.7-1)

Structurally, the Peninsular Ranges are traversed by several major active faults. The Elsinore, San Jacinto, and San Andreas faults are major active fault systems located northeast of metropolitan San Diego, and the Rose Canyon, San Diego Trough, Coronado Bank, and San Clemente faults are major active faults located within or west-southwest of metropolitan San Diego. Major tectonic activity associated with these and other faults within this regional tectonic framework is generally right-lateral strike-slip movement. The area to the east of the faults is known as the Salton Trough–Gulf of California depression, which formed during the separation of Baja California from the Mexico mainland. The Salton Trough, being lower than the surrounding landscape, became an area of deposition with sediments being carried to the depressed area by drainages of the peninsular ranges and the Colorado River. Occasionally, the Salton Trough was inundated with marine waters from the Gulf of California, adding marine deposits to the sediment (Peterson 1977), and has been repeatedly filled by floods from the Colorado River.

The coastal plain province extends from the western edge of the Peninsular Ranges to the coastline. The coastal plain ranges in elevation from sea level to approximately 600 feet above mean sea level. Most of the incorporated cities in the San Diego region are in the coastal plain. The province is composed of dissected, mesa-like terraces that graduate inland into rolling hills. The terrain is underlain by sedimentary rocks composed mainly of Late Mesozoic, Tertiary, and Quaternary sandstone, shale, and conglomerate beds, reflecting the erosion mountain ranges to the east prior to the uplift of the Peninsular ranges (Figure 4.7-1) (Peterson 1977).

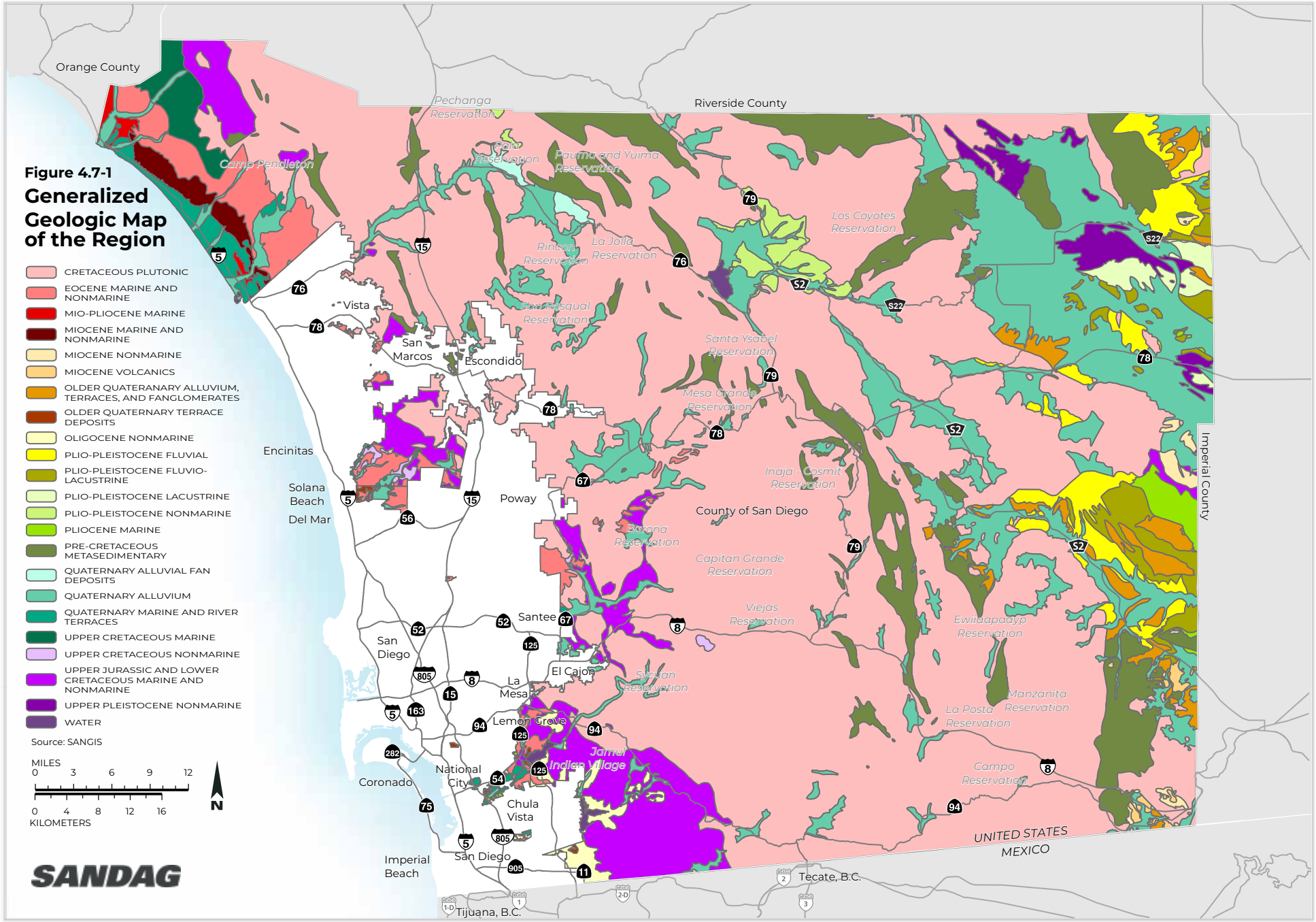


Figure 4.7-1
Generalized Geologic Map of the Region
CRETACEOUS PLUTONIC
EOCENE MARINE AND NONMARINE
MIO-PLIOCENE MARINE
MIOCENE MARINE AND NONMARINE
MIOCENE NONMARINE
MIOCENE VOLCANICS
OLDER QUATERNARY ALLUVIUM, TERRACES, AND FANGLOMERATES
OLDER QUATERNARY TERRACE DEPOSITS
OLIGOCENE NONMARINE
PLIO-PLEISTOCENE FLUVIAL
PLIO-PLEISTOCENE FLUVIO-LACUSTRINE
PLIO-PLEISTOCENE LACUSTRINE
PLIO-PLEISTOCENE NONMARINE
PLIOCENE MARINE
PRE-CRETACEOUS METASEDIMENTARY
QUATERNARY ALLUVIAL FAN DEPOSITS
QUATERNARY ALLUVIUM
QUATERNARY MARINE AND RIVER TERRACES
UPPER CRETACEOUS MARINE
UPPER CRETACEOUS NONMARINE
UPPER JURASSIC AND LOWER CRETACEOUS MARINE AND NONMARINE
UPPER PLEISTOCENE NONMARINE
WATER
Source: SANGIS
MILES 0 3 6 9 12
0 4 8 12 16 KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
UNITED STATES
MEXICO
Pechanga Reservation
Camp Pendleton
Pauma and Yuima Reservation
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Vista
San Marcos
Escondido
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
Tijuana, B.C.
Tecate, B.C.

Seismic Setting

Primarily northwest-to-southeast trending faults traverse Southern California and mark the boundary between the North American and Pacific tectonic plates. The majority of the plate motion is taken up on the San Andreas fault zone. The remaining plate motion is taken up by subsidiary faults, many of which are located across the San Diego region and the nearshore Pacific Ocean. These faults have the potential for generating strong ground motions in the San Diego region. Most recorded earthquakes and fault ruptures in Southern California have occurred along faults associated with the San Andreas fault zone. The San Andreas fault zone and the associated faults that define the plate boundary are called the San Andreas fault system.

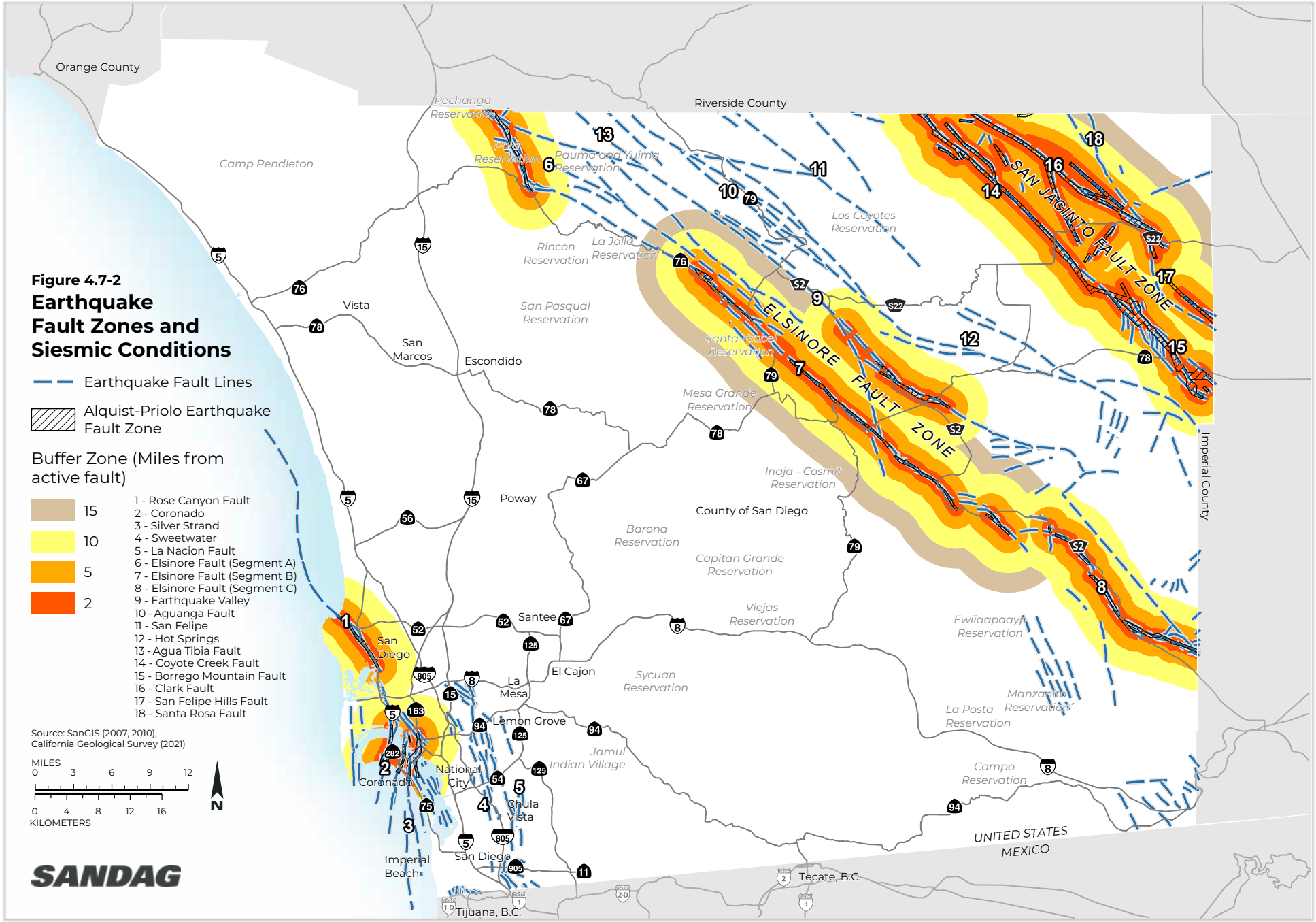
The entire San Andreas fault zone is more than 800 miles long. In detail, the fault is a complex zone of crushed and broken rock from a few hundred feet to a mile wide (USGS 2016). It is located to the east of the San Diego region, along the east side of the Coachella and Imperial valleys. Since high-magnitude shocks transmit energy over large areas, faults located outside of the San Diego region (such as the San Andreas) can cause ground shaking inside the region during earthquakes. The nearest inhabited sections of the San Diego region are approximately 30 miles from the San Andreas fault.

Known active faults and Alquist-Priolo special studies zones in the San Diego region are shown on Figure 4.7-2.[1] Earthquakes in the San Diego region occur when the plate motion causes the ground to move in opposite directions on either side of a fault deep in the earth. Most earthquakes in the San Diego region originate at least 10 miles below the ground surface. That movement creates shock waves that move through the ground causing it to shake. In general, the larger the earthquake the more intense the ground shaking and the more potential for damage. Because earthquake shaking decreases in intensity with distance from the epicenter of the earthquake, knowing the locations and seismic history of individual faults is important for designing earthquake resistant structures.

The San Jacinto fault is the largest of the active faults in San Diego region. The fault extends approximately 125 miles from Imperial Valley to San Bernardino (California Geologic Survey 2010). The Coyote Creek fault and Borrego Mountain faults in the northeastern San Diego region are segments of the San Jacinto fault. Historical activity associated with the San Jacinto fault occurred in 1890, 1899, 1968, and 1979 (Rasmussen 1982). The 1968 quake had a recorded magnitude of 6.8 and was centered near Ocotillo Wells (Figure 4.7-2).

The Elsinore fault represents a serious earthquake hazard for most of the populated areas of the San Diego region. This fault is approximately 135 miles long and is located about 40 miles from downtown San Diego. This fault can register large earthquakes between magnitude 6.9 to 7.0 with a recurrence interval of approximately 100 years (Figure 4.7-2) (City of San Diego 2007).

[1] Note that the California Geological Survey ~~is in the process of updating fault zones in the region, with an anticipated completion later this year in 2021. If the information becomes available prior to certification of the Final EIR then the data will be updated in this document.~~officially finalized updates to the fault zone maps for the region on September 23, 2021.


Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pauma and Yuima Reservation
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Isabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
SAN JACINTO FAULT ZONE
ELSINORE FAULT ZONE
Vista
San Marcos
Escondido
Poway
County of San Diego
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
San Diego
Imperial Beach
Coronado
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.7-2
Earthquake Fault Zones and Siesmic Conditions
Earthquake Fault Lines
Alquist-Priolo Earthquake Fault Zone
Buffer Zone (Miles from active fault)
15
10
5
2
1 - Rose Canyon Fault
2 - Coronado
3 - Silver Strand
4 - Sweetwater
5 - La Nacion Fault
6 - Elsinore Fault (Segment A)
7 - Elsinore Fault (Segment B)
8 - Elsinore Fault (Segment C)
9 - Earthquake Valley
10 - Aguanga Fault
11 - San Felipe
12 - Hot Springs
13 - Agua Tibia Fault
14 - Coyote Creek Fault
15 - Borrego Mountain Fault
16 - Clark Fault
17 - San Felipe Hills Fault
18 - Santa Rosa Fault
Source: SanGIS (2007, 2010), California Geological Survey (2021)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

The Rose Canyon fault zone is an active offshore/onshore fault capable of generating an earthquake of magnitude 6.2 to 7.0. The fault zone lies partially offshore as part of the Newport/Inglewood fault zone and parallels the northern coastline of the San Diego region at a distance of approximately 2 to 6 miles until coming ashore near La Jolla Shores. The onshore segment trends through Rose Canyon and Old Town San Diego and separates into at least three active faults beneath the San Diego Airport, San Diego Bay, Coronado, and North Island faults. The fault zone is composed of individual mappable fault segments, including the Rose Canyon, San Diego, Downtown San Diego Graben, Silver Strand, Coronado and Spanish Bight faults (Figure 4.7-2) (Treiman 1993).

The major offshore fault zones are the San Clemente, San Diego Trough, and Coronado Bank. The San Clemente fault zone, located approximately 40 miles off La Jolla, is the largest offshore fault (Figure 4.7.2). Tsunamis are a potential hazard associated with seismic setting and fault zones, and are described in Section 4.10, *Hydrology and Water Quality*.

Fault Rupture

If an earthquake is large enough, the motion on the fault can propagate up to the ground surface. Fault rupture is defined as the breakage of ground along the fault at the intersection of the fault with the Earth's surface. Earthquakes can cause large vertical and/or horizontal displacement of the ground along the fault. Ground rupture can severely damage structures straddling active faults by rupturing foundations or by tilting foundation slabs and walls, as well as damage buried and above ground utilities. Drinking water can be lost, and the loss of water lines or water pressure can affect emergency services, including firefighting ability. Research of historical earthquakes has shown that, although only a few structures have been ripped apart by fault rupture, this hazard can produce severe damage to structures built across active fault lines (Figure 4.7-2) (California Geological Survey 2018).

Ground Shaking

Ground shaking produces the vast majority of damage in an earthquake. Several factors control how ground motion interacts with structures, making the hazard of ground shaking difficult to predict. Seismic waves propagating through the Earth's crust are responsible for the ground vibrations normally felt during an earthquake. Seismic waves can vibrate in any direction, and at different frequencies, depending on the content of the earthquake rupture mechanism and the path and material through which the waves are propagating. The earthquake rupture mechanism is the distance from the earthquake source, or epicenter, to an affected site. The potential damage to public and private buildings and infrastructure from seismic ground shaking can threaten public safety and result in significant economic loss.

Slope Failure/Landslides

Slope failure, also referred to as mass wasting, is the downslope movement of soil and rock material in response to gravitational stresses. Landslides are the most common naturally occurring type of slope failure in the San Diego region. The term *landslide* describes a wide variety of processes that result in the downward and outward movement of slope-forming materials. Landslides are categorized by the type of material (rock or soil), and landslide movement is categorized by the type of movement (falls, topples, slides, or flows). Earthquakes can intensify or activate an unstable slope. Loosely and weakly consolidated soils, steepened slopes caused by either human activities or natural causes, and saturated earth materials create a fragile situation easily affected by an earthquake. Landslides in the San Diego region generally occur in sedimentary rocks such as sandstone,

siltstone, mudstone, and claystone. Heavy rainfall can exacerbate conditions for landsliding. The most common landslides triggered by winter storms are debris flows (popularly called *mudslides*), which are shallow landslides of water-saturated soil and rock fragments that travel downslope rapidly as muddy slurries. The flowing mud carries rocks, vegetation, and other natural and human-made debris as it rushes down the slopes (USGS 2005).

Major landslides have occurred within the incorporated cities of the region that are located on hillside terrain or on coastal bluffs. Previous landslides and landslide-prone sedimentary formations are mostly located in the western portion of the region. Landslides have also occurred in the granitic terrain in the eastern portion of the San Diego region. Reactivations of existing landslides can be triggered by a variety of factors, such as heavy rainfall or irrigation, seismic shaking, and grading (Peterson 1977).

The California Department of Conservation (CDC) maps and describes landslide hazards in the region on two map sets containing eight mapped quadrangles each. The scale on the maps is used to designate susceptibility to slope hazards and includes four different levels (areas) (CDC 2018a):

- **Area 1 – Least Susceptible.** Landslides and other features related to slope instability are non-existent to very rare within this area primarily due to lack of steep slopes.
- **Area 2 – Marginally Susceptible.** Landslides and other slope failures are rare within this area although slope hazards are possible on steeper slopes within the area or along its borders.
- **Area 3 – Generally Susceptible.** This category contains two subareas. In Subarea 3-1, although most slopes herein do not contain landslide deposits, they can be expected to fail, locally, when adversely modified. In Subarea 3-2 slopes are less stable and more susceptible to landslide and slope failure.
- **Area 4 – Most Susceptible.** The area is characterized by unstable slopes and includes all landslides shown on the maps (whether active or not) and slopes where there is evidence of downslope creep of surface materials. These slopes are considered naturally unstable and subject to failure even in the absence of human activity. This category contains two subareas. Subarea 4-1 contains observable unstable slopes underlain by both weak materials and adverse geologic structure. Beach areas exposed to sea waves are not included as beach erosion is not considered a slope hazard. Subarea 4-2 includes definite landslides mapped by the CDC, and nearby unstable areas.

Areas in the region mapped as Area 4 include portions of the southeastern Imperial Beach Quadrangle, which align with southwest potions of the Otay Mesa Quadrangle. The southern tip of Point Loma, along the eastern side of the peninsula, is also an Area 4 region. Area 4 regions are throughout the La Jolla Quadrangle and the La Mesa Quadrangle, in various parts of the San Diego Metropolitan area, and throughout the Del Mar Quadrangle and the southern part of the Rancho Santa Fe Quadrangle. The Oceanside and San Luis Rey, Jamul Mountains, National City, El Cajon, Poway, Escondido, Encinitas, San Marcos, and Valley Center quadrangles are partially located within Area 4 in smaller concentrations compared to those listed above.

Areas prone to landslides are underlain by the Ardath Shale, Friars, Mission Valley, San Diego, and Otay rock formations. The Ardath Shale Formation extends from Torrey Pines State Park to Mission Bay and is composed of interbedded sandstone and weak claystone. The Friars Formation occurs from Mission Valley to Carmel Valley. The formation is composed of expandable clays with properties similar to those of bentonite. The Mission Valley Formation is found from Otay Valley to Rancho Bernardo and is composed of fine to medium grained sandstone with cobble, claystone, and expansive clays (Brown 2018). The San Diego Formation occurs throughout the coastal mesas from Mission Valley southward to the Mexican border. The Otay Formation is

found in the southwestern portion of the San Diego region and is composed of slide-resistant sandstone with occasional thin interbedding of bentonite clay (CDC 2018b).

Liquefaction

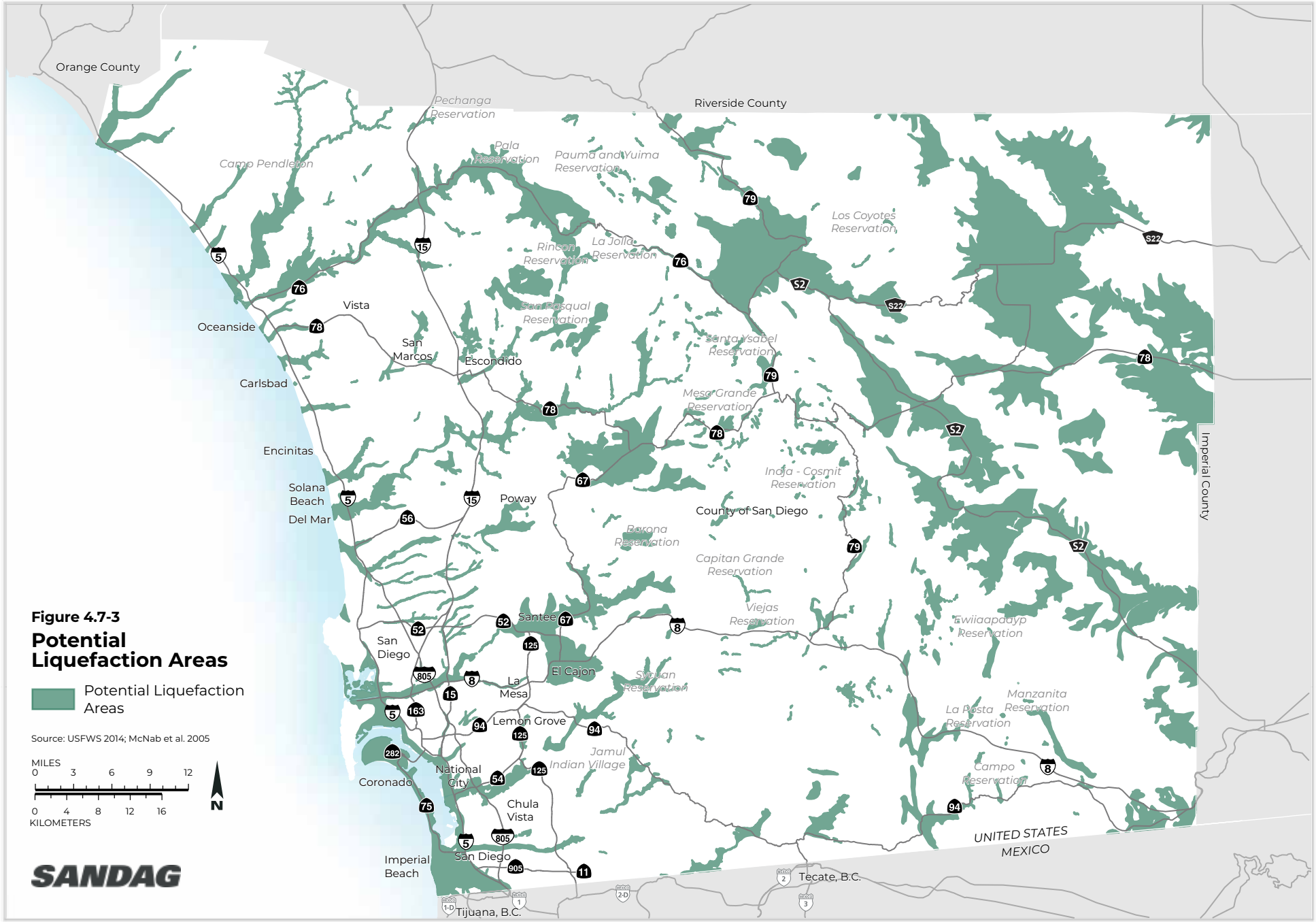
Liquefaction is a phenomenon whereby unconsolidated and/or near-saturated soils lose cohesion as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in temporary, fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, underground cables, and buildings with shallow foundations. Research and historical data indicate that loose granular soils and non-plastic silts that are saturated by a relatively shallow groundwater table are susceptible to liquefaction. Sites underlain by relatively loose sandy soils and saturated deposits of fill combined with a shallow groundwater table, which typically are located in alluvial river valleys/basins, floodplains, beach and bay shorelines, and hydraulic fills are susceptible to liquefaction. Large areas within the region known to be subject to liquefaction are, for the most part, found in the eastern parts of the region. However, liquefaction-prone areas are also associated with hydraulic fills along the shorelines of San Diego Bay, Mission Bay, and the estuaries along the San Diego coastline (Figure 4.7-3) (County of San Diego 2009a).

Expansive Soils

Expansive soils contain minerals such as smectite clays that are capable of absorbing water. When they absorb water, they increase in volume. The more water they absorb the more their volume increases; for example, an expansion of 10 percent is not uncommon. This change in volume can exert enough force on a building or other structure to cause damage.

Expansive soils will also shrink when they lose moisture or dry out. This shrinkage can remove support from structures and result in damage when structures are not designed to withstand changing soil pressures. Fissures in the soil can also develop. These fissures can facilitate dispersion of water when moist conditions or runoff occurs. This produces a cycle of shrinkage and swelling that places repetitive stress on structures Expansive soils occur throughout the San Diego region. Areas with potential to have expansive soils within the region occur predominately in the coastal plains, an area of dissected marine terraces and uplands. They can also be found in valleys and on slopes in the foothills and mountains of the Peninsular Ranges province and, to a lesser extent, in the desert portions of the San Diego region (Peterson 1977).

Expansive soils primarily consist of clayey soils that have a potential for significant volume changes (shrinking and swelling) with moisture fluctuations. According to the National Geologic Map Database's Swelling Clays Map of the conterminous United States, coastal San Diego lies in an area described as "part of the unit, generally less than fifty percent, consists of clays of slight to moderate swelling potential." The remaining areas of the San Diego region are typically underlain by soils with little or no clays with swelling potential (Olive et al. 1989).


Orange County
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La Posta Reservation
Campo Reservation
Jamul Indian Village
Camp Pendleton
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
San Diego
Imperial Beach
UNITED STATES
MEXICO
Tecate, B.C.
Tijuana, B.C.
Figure 4.7-3
Potential Liquefaction Areas
Potential Liquefaction Areas
Source: USFWS 2014; McNab et al. 2005
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Erosion and Loss of Topsoil

Erosion is defined as a combination of processes in which the materials of the Earth's surface are loosened, dissolved, or worn away, and transported from one place to another by natural agents. Erosion potential in soils is influenced primarily by loose soil texture and steep slopes. Steep slopes and bluffs resulting from beach side erosion and wave action are found along the coastal cities in the northern part of the San Diego region, particularly in and near La Jolla Del Mar, Solana Beach, and Encinitas. (Kuhn, G. G., Shepard, F. P., 1984) Areas of potential slope failure or high erodibility are potentially hazardous. Loose soils and topsoil can be eroded by water or wind forces, whereas soils with high clay content are generally susceptible only to water erosion. The potential for erosion and loss of topsoil generally increases due to human activity, primarily through construction activities, the development of structures and impervious surfaces, and the removal of vegetative cover. (Brady and Weil 1999, United States Department of Agriculture 2000)

Erosion or loss of topsoil can cause loss of arable land, clogged and polluted waterways, and increased flooding. When topsoil is mobilized, or moved, it is put into the hydrological system as silt and eventually washes out to sea. Erosion is the term given to soil loss due to the mobilization of topsoil by the forces of water and wind. Wind and water move the eroded particles to some other location, where it is deposited as sediment (University of Michigan 2010). The rate of this process, as stated, is highly dependent on human activity. Natural rates of soil erosion are lower for soil with a good cover of vegetation than for bare soil. In addition to the factors listed above, human actions that uncover soil include farming, logging, building, overgrazing, off-road vehicles, and fires, all of which greatly enhance soil erosion rates.

Septic Systems

Areas not serviced by wastewater districts typically have septic systems, also referred to as Onsite Wastewater Treatment Systems (OWTS), for wastewater disposal. The most common type of septic system found in the San Diego region consists of a septic tank connected to leach lines (County of San Diego 2020). Areas with OWTS, rather than sewer connections, include the unincorporated County communities of North Mountain, Ramona, Rainbow, San Dieguito, Spring Valley, Sweetwater, Valley Center, Alpine, Bonsall, Fallbrook, Central Mountain, North County Metro, Mountain Empire, Julian, Desert, and Crest/Dehesa.

PALEONTOLOGICAL RESOURCES

Paleontological resources represent a limited, nonrenewable, and impact-sensitive scientific and educational resource. *Paleontological resources* (i.e., fossils) are defined herein as the remains and/or traces of prehistoric plant and animal life. Fossils such as bones, teeth, shells, and leaves are found in geologic deposits (rock formations) within which they were originally buried. Paleontological resources include not only fossils themselves, but also the associated rocks or organic matter.

Paleontological resources vary widely in their relative abundance and distribution, and not all are regarded as significant. One of the questions listed in the CEQA Environmental Checklist is: "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" However, CEQA does not include a definition for "unique paleontological resource." Absent specific agency guidelines, most professional paleontologists in California adhere to guidelines set forth by the Society of Vertebrate Paleontology (SVP), which defines a significant paleontological resources as "fossils and fossiliferous deposits…consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace

fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information" (SVP 2010).

Known paleontological resources found in regions of moderate to high paleontological sensitivity throughout the San Diego region are presented in Table 4.7-1. San Diego County assigns a high paleontological sensitivity to geologic units known to contain paleontological localities with rare, well-preserved, critical fossil materials for stratigraphic or paleoenvironmental interpretation, and fossils providing information about the paleoclimatic, paleobiological and/or evolutionary history (phylogeny) of animal and plant groups (County of San Diego 2009b). A moderate paleontological sensitivity is assigned to geologic units known to contain paleontological localities and that have been judged to have a strong, but often unproven, potential for producing unique fossil remains (County of San Diego 2009b).

Table 4.7-1
Paleontological Resources

Geologic Unit	Age	Sensitivity	Paleontological Resources Found
Coastal Plain Region			
Unnamed River Terrace Deposits	Late Pleistocene	Moderate	• Terrestrial vertebrates (i.e., pond turtle, passenger pigeon, hawk, shrew, mole, mice, gopher, squirrel, rabbit, ground sloth, wolf, camel, deer, horse, mastodon, and mammoth)
Unnamed Marine Terrace Deposits	Late Pleistocene	Moderate to High	• Marine invertebrate fossils (e.g., mollusks, crustaceans, and echinoids) • Marine vertebrates (e.g., sharks, rays, and bony fish) • Terrestrial mammals (e.g., camel, horse, and mammoth)
Bay Point Formation	Late Pleistocene	High	• Invertebrate fossils (primarily mollusks) • Marine vertebrates (i.e., sharks, rays, and bony fishes)
Lindavista Formation	Early Pleistocene	Moderate	• Invertebrate fossils (i.e., clams, scallops, snails, barnacles, and sand dollars) • Marine vertebrates (i.e., sharks and baleen whales)
San Diego Formation	Late Pliocene	High	• Marine vertebrates and invertebrates (i.e., clams, scallops, snails, crabs, barnacles, sand dollars, sharks, rays, bony fishes, sea birds, walrus, fur seal, sea cow, dolphins, and baleen whales) • Terrestrial mammals (e.g., cat, wolf, skunk, peccary, camel, antelope, deer, horse, and gomphothere) • Fossil wood and leaves (e.g., pine, oak, laurel, cottonwood, and avocado)

Geologic Unit	Age	Sensitivity	Paleontological Resources Found
San Mateo Formation	Late Pliocene to Late Miocene	High	• Marine vertebrates (e.g., rays, sharks, bony fishes, sea birds, dolphins, sperm whale, baleen whales, sea cow, fur seals, walrus, and sea otter) • Terrestrial mammal remains (e.g., horse, camel, llama, and peccary) • Marine invertebrates (e.g., clams, scallops, snails, and sea urchins)
Capistrano Formation	Late Miocene	High	• Marine vertebrates (e.g., sharks, rays, bony fishes, sea birds, toothed whales, baleen whales, sea cow, fur seals, and walruses) (Orange County)
San Onofre Breccia	Middle Miocene	Moderate	• Poorly preserved remains of nearshore marine foraminifers, bivalve mollusks, and unidentified mammals
Otay Formation	Late Oligocene	High (upper sandstone); Moderate (lower gritstone and fanglomerate)	• Terrestrial vertebrates (e.g., tortoise, lizards, snake, birds, shrews, rodents, rabbit, dog, fox, rhinoceros, camels, mouse-deer, and oreodonts)
Sweetwater Formation	Late to Middle Eocene	High	• Dental remains of opossums, insectivores, and rodents (lower part of the formation) • A few nondiagnostic mammal teeth (upper part of the formation)
Pomerado Conglomerate	Middle to Late Eocene	High	• Terrestrial mammals (e.g., insectivores, primates, rodents, opossums, oreodonts [*Protoreodon* and *Leptoreodon*] and other artiodactyls [*Hypertragulus*], extinct carnivorous mammals [*Hyaenodontid* and *Miacis*], and horse [*Mesohippus*]) • Nearshore marine mollusks (e.g., clams and snails)
Mission Valley Formation	Eocene	High	• Marine microfossils (e.g., foraminifers) and macroinvertebrates (e.g., clams, snails, crustaceans, and sea urchins) • Marine vertebrates (e.g., sharks, rays, and bony fish) • Petrified wood • Terrestrial mammals (e.g., opossums, insectivores, bats, primates, rodents, artiodactyls, and perissodactyls)

Geologic Unit	Age	Sensitivity	Paleontological Resources Found
Stadium Conglomerate (Upper)	Middle Eocene	Moderate to High	• Fossil foraminifers, marine mollusks, opossums, insectivores, primates, rodents, carnivores, rhinoceros, and artiodactyls • Petrified wood
Stadium Conglomerate (Lower)	Middle Eocene	High	• Sparse marine fossil remains and benthic foraminifers • Unusual and scientifically important terrestrial mammal assemblage
Friars Formation	Middle Eocene	High	• Terrestrial vertebrates; especially terrestrial mammals (e.g., opossums, insectivores, primates, rodents, artiodactyls, and perissodactyls) • Marine microfossils and macroinvertebrates • Fossil leaves
Scripps Formation	Middle Eocene	High	• Marine invertebrates and vertebrates (e.g., clams, snails, crabs, sharks, rays, and bony fish) • Terrestrial mammals (e.g., uintatheres, brontothere, rhinoceros, and artiodactyl) • Reptiles (e.g., crocodile and turtle). • Petrified wood
Santiago Formation (Member C)	Middle Eocene	High	• Vertebrate fossils: turtles, snakes, lizards, crocodiles, birds, and mammals (e.g., opossums, insectivores, primates, rodents, brontotheres, tapirs, protoreodonts, and other early artiodactyls) • Marine organisms (e.g., calcareous nannoplankton and mollusks)
Santiago Formation (Member B)	Middle Eocene	High	• Terrestrial vertebrates (e.g., opossums, insectivores, primates, rodents, brontothere, rhinoceros, and uintathere) • Marine and estuarine mollusks
Santiago Formation (Member A)	Middle Eocene	Moderate	• Member "A" has yet to produce any fossils, but the discovery of any diagnostic fossils in this rock unit would be of great importance in resolving the age and stratigraphic significance of the Santiago Formation
Ardath Shale	Middle Eocene	High	• Diverse and well-preserved assemblages of marine microfossils, macroinvertebrates, and vertebrates (e.g., sharks, rays, and bony fish)

Geologic Unit	Age	Sensitivity	Paleontological Resources Found
Torrey Sandstone	Early Middle Eocene	Moderate	• Plant remains (mostly leaves) • Invertebrate fossils primarily consist of nearshore marine taxa (e.g., clams, oysters, snails, and barnacles) • Vertebrate fossil remains are rare and include teeth of crocodiles, sharks, and rays
Delmar Formation	Late Early to Early Middle Eocene	High	• Estuarine invertebrates (e.g., clams, oysters, and snails) • Estuarine vertebrates (e.g., sharks and rays) • Well-preserved skull remains of aquatic reptiles (e.g., crocodile) and terrestrial mammals (e.g., tillodont and early rhinoceros)
Mount Soledad Formation	Late Early to Early Middle Eocene	Moderate (lower resource sensitivity in the lower conglomeratic portion of the formation)	• Marine organisms (e.g., mollusks, planktonic foraminifers, benthonic foraminifers, and pollen)
Unnamed Formation	Early Eocene	High	• Dental remains of multituberculates, opossums, insectivores, primates, "condylarths," and rodents
Cabrillo Formation	Late Cretaceous	Moderate	• Marine invertebrates (e.g., clams, snails, and ammonites) • Marine vertebrates (e.g., sharks)
Point Loma Formation	Late Cretaceous	High	• Marine invertebrates (e.g., clams, snails, nautiloids, ammonites, crabs, and sea urchins) • Marine vertebrates (e.g., sharks and mosasaurs) • Terrestrial plants (leaves and wood) • Dinosaurs, including armored dinosaur (nodosaur) and duck-billed dinosaur (hadrosaur)
Lusardi Formation	Late Cretaceous	Moderate	• Fragments of plant material • The Cretaceous age of this rock unit coupled with its terrestrial depositional setting suggests the potential presence of dinosaurs and other terrestrial vertebrates
Peninsular Ranges Region			
Older Quaternary Alluvial Fan Deposits	Late Pleistocene	Moderate	• Scattered vertebrate remains of late Pleistocene age

Geologic Unit	Age	Sensitivity	Paleontological Resources Found
Pauba Formation	Late Pleistocene	Moderate	• Terrestrial mammals (e.g., shrew, rabbit, kangaroo rat, gopher, mice, deer, pronghorn, camel, horse, and elephant) • Freshwater diatoms
Temecula Arkose	Pleistocene	High	• Terrestrial mammals (e.g., rabbits, rodents, wolf, badger, bobcat, elephant, horse, camel, deer, and antelope) • Freshwater diatoms and snails
Jacumba Volcanics	Early Miocene	Moderate (tuffaceous sandstone); Zero (volcanic plugs, lava flows, etc.)	• Fossil bone fragments in fine-grained tuffaceous sandstone • Identifiable fossils should eventually be found in the tuffaceous sandstone sediments
Table Mountain Gravels	Early to Middle Eocene	High	• Terrestrial mammals (e.g., rodents, rabbits, and large hoofed mammals [camel and unidentified artiodactyls]) including teeth, limb bones, and miscellaneous bone fragments
Santiago Peak Volcanics	Early Cretaceous	High (metasedimentary rocks); Marginal (metavolcanics rocks)	• Volcanic breccias have produced petrified wood • Metasedimentary rocks have produced microfossils (e.g., radiolarians) and marine macroinvertebrates (e.g., belemnites and clams)
Salton Trough Region			
Later Quaternary Alluvium	Holocene	Moderate	• Only subfossils are expected. Lake Cahuilla deposits have produced well-preserved subfossil remains of freshwater clams, snails, and fish
Older Terraces, Fanglomerates, and Valley Fill Alluvium	Late Pleistocene to Holocene	Moderate	• No fossils are known from these deposits but are possibly present based on the sediment age and sedimentary origin
Brawley Formation	Early to Middle Pleistocene	Moderate	• Lacustrine invertebrate fauna (e.g., mollusks and diatoms) • Rare freshwater vertebrates
Ocotillo Conglomerate	Early Pleistocene	High	• Terrestrial vertebrates (e.g., turtle, bird, ground sloth, rabbit, rodents, wolf, bear, bobcat, lion, sabertooth cat, mammoth, zebra, horse, camel, llama, deer, antelope, and ox)
Borrego Formation	Early Pleistocene	High	• Mollusks, ostracods, and rare foraminifers • Terrestrial vertebrates

Geologic Unit	Age	Sensitivity	Paleontological Resources Found
Canebrake Conglomerate	Late Pliocene to Early Pleistocene	Moderate	• Has not yet yielded any fossils
Palm Springs Formation	Late Pliocene to Early Pleistocene	High	• Over 100 species of Plio-Pleistocene terrestrial vertebrates (e.g., turtles, snakes, lizards, hawk, eagle, vulture, ground sloth, shrews, rodents, mastodon, camel, llama, and horse)
Imperial Formation	Late Miocene to Early Pliocene	High	• Over 200 species of marine fossils, (e.g., foraminifers, corals, clams, snails, ostracods, barnacles, crabs, sand dollars, and sea urchins) • Marine vertebrates (e.g., sharks, rays, bony fish, sea cow, baleen whale, and walrus)
Split Mountain Formation	Late Miocene to Early Pliocene	Moderate	• Marine microfossils such as foraminifers
Alverson Volcanics	Middle Miocene	Moderate	• Algae, pollen, petrified wood, mollusks, and a vertebrate bone fragment
Anza Formation	Early to Middle Miocene	Moderate	• Unidentifiable bone fragments

Source: Deméré and Walsh 2011.

UNIQUE GEOLOGIC FEATURES

A unique geologic feature may be the best example of its kind locally or regionally; it may illustrate a geologic principle, it may provide a key piece of geologic information, it may be the "type locality" of a fossil or formation, or it may have high aesthetic appeal. Unique geologic features may be exposed or created from natural weathering and erosion processes or from human-made excavations. These unique geological features provide aesthetic, scientific, educational, and recreational value. Unique geological features throughout the San Diego region were documented in the 1975 San Diego County General Plan. This inventory from the 1975 General Plan is listed in Table 4.7-2 and provides more detailed information than the more recent General Plan Update adopted in 2011.

Table 4.7-2
Unique Geologic Features

Unique Geological Feature	Location
Indian Mountain Leucogranodiorite	Banks of San Luis Rey River, a few miles southwest of Pala
Pliocene San Mateo Formation	Along San Mateo Creek
San Onofre Breccia	San Onofre Hills
Monterey Shale	Along sea cliffs southeast of San Onofre
Bonsall Tonalite	Bonsall, west central San Luis Rey Quad

Unique Geological Feature	Location
Petrified forest with logs in exposures of the prebatholithic volcanics and sedimentary rocks containing leaf imprints	Lusardi Canyon near Rancho Santa Fe near junction with San Dieguito River
Prebatholithic folded slates	Lusardi Canyon near Rancho Santa Fe near junction with San Dieguito River
The Lusardi Formation consisting of a conglomerate unit	Lusardi Canyon near Rancho Santa Fe near junction with San Dieguito River
Lake Wohlford Leucogranodiorite	Lake Wohlford, between Escondido and Lake Wohlford
San Marcos Gabbro	San Marcos Mountains, San Luis Rey Quad
Woodson Mountain Granodiorite	Woodson Mountain, a few miles southwest of Ramona
Swarm of distinctly oriented inclusion in Lakewood Mountain Tonalite composing outer ring dike; core is Green Valley Tonalite	East of Ramona
Area of prebatholic metamorphics, quartzite exhibiting swirls of magnitite and biotite, which may represent relic crossbedding	Vicinity Highway 78 and San Pasqual
Green Valley Tonalite	Southeast San Luis Rey Quad; Green Valley between State Route (SR) 395 and Ramona
Elsinore Fault, canyon eroded along fault, and tributaries offset in a right lateral sense; typical exposure of Julian Schist	Julian, Santa Ysabel Quadrangle
Split Mountain Formation	Split Mountain Gorge, south of Ocotillo, west side of Imperial Valley
Localities indicating age of peak volcanics: at (a) *Buchia piochii* belemnoids, and ammonite were found; at (b) there are belemnoids, flame structures, flute castes, and graded bedding	(a) Los Peñasquitos; (b) San Santiago Dieguito, vicinity of San Dieguito River
Eocene vertebrate fossil locality	Bank of San Diego River near Grantville
Eocene vertebrate fossil locality	Bank of San Diego River near Friars Road and Ulric Street
Exposures of fossiliferous Eocene and Pliocene strata; the Pliocene rocks are preserved by down faulting and contain sharks teeth, whale bones, and delicate *Glottidia albida*	Tecolote Creek
Bay Point Formation	West shore of Bay Point Mission Bay
Type area of the Rose Canyon Shale	Rose Canyon
Eocene foraminifera area	Old Murray Canyon Quarry
Green Eocene mudstones, containing large leaf imprints, petrified logs, and pelecypod molds	Black Mountain

Unique Geological Feature	Location
Black Mountain Volcanics, greenstones with primary structures; quartzose pseudomorphs of gastropods	Black Mountain
Exposure of San Diego Formation containing whole bones and sharks teeth	Vicinity of Miramar Reservoir
Type locality of *Spatangus rarus Israelsky*; known only from type locality	Pacific Beach
Type localities of Pecten (patinopecten) healeyi, Pecten (Pecten) stearsi, Pecten (argopecten) subdolus, and Pecten (Pecten) bellus hemphilli	Pacific Beach
Delmar Formation	Sea cliff and short canyon in Del Mar
Mount Soledad Formation	West of intersection of Ardath Road and Interstate (I-) 5
Mission Valley Formation	South wall of Mission Valley on west side of SR 163 at the junction of I-8
Stadium Conglomerate	North wall of Mission Valley west of Murphy Canyon Road from Friars Road
Scripps Formation	Torrey Pines Grade
Friars Formation	North wall of Mission Valley along Friars Road
Torrey Sandstone	Torrey Pines Grade
Ardath Shale	East side of Rose Canyon south of intersection of Ardath Road and I-5
Exposures of Santiago Peak Volcanics showing unique stratigraphic and structural relationships between many units typical of formation; also, type locality when first named Black Mountain Volcanics	North of Black Mountain, La Jolla Quadrangle
Exposure of an old “unnamed” fanglomerate composed of metamorphic rocks, one of the highest surfaces of the “high terrace” cut into Stadium Conglomerate, and a “contact breccia” migmatite zone	Vicinity of I-8, west of San Vicente Reservoir
Basal contact of Ballena Gravels eastward; mechanically just folded border of Woodson Mountain Granodiorite against narrow screen of metamorphic rocks and banded structures in gabbro on other side	Vicinity of Wildcat Canyon Road sloping just east of San Vicente Creek
An unusual occurrence of dumortierite, similanite, and associated minerals	Dehesa Toad and Tavern Road, Alpine
An unusual occurrence of orbicular gabbro	Dehesa Road west of the Harbison Canyon Road intersection Alpine

Unique Geological Feature	Location
Prebatholithic metavolcanics, in selected places coarse pyroclastic and blastoporphyritic fabrics as well as original bedding are visible; often very gneissic	Vicinity of I-8 south of Lake Jennings
Mixed and roof pendants in the prebatholithic metavolcanics	Vicinity of La Cresta Road, El Cajon
Contact of Woodson Mountain Granodiorite and Green Valley Tonalite	Vicinity of La Cresta Road, El Cajon
Roof pendant of metavolcanics in the Green Valley Tonalite	Vicinity of San Diego River west of El Capitan Reservoir
Stonewall Quartz Diorite	Stonewall Peak in Cuyamaca Region
Exposure of Bay Point Formation fauna	Vicinity of the U.S./Mexican border 1/4 mile from the coast
Pliocene San Diego Formation fossils	Vicinity of the U.S./Mexican border 2 miles from the coast
Cabrillo Formation	Sea cliff in Point Loma
Point Loma Formation	Along Point Loma Peninsula at southern end
La Posta Quartz Diorite	La Posta Valley
Stratigraphic relationship between Jacumba volcanic rock (Alverson Andesite) and "Table Mountain Gravels" and reworked younger gravels	West of Jacumba

Source: County of San Diego 1975.

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

Climate change may threaten geology, soils (including soil health, productivity and carbon sequestration), and paleontological resources due to sea-level rise submerging coastal lands, more frequent and severe precipitation events, higher temperatures, and higher incidence of wildfire. The San Diego region is likely to experience sea-level rise of up to 1.2 feet by 2050, wetter winters and more intense precipitation that can lead to increased flooding, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season. More details on future climate projections are available in Appendix C.

Climate change could increase the occurrence of landslides in Southern California by worsening the weather conditions that lead to their occurrence. Periods of dryness followed by extreme precipitation events can cause conditions suitable for landslides. Also, wildfires in summer can burn away trees or vegetation that hold soil in place on slopes, and heavy rainfall in the winter may create a debris flow that then results in a landslide (Highland 2005). Both wildfires and storm intensity are projected to increase in the San Diego region by 2050, creating conditions that could bring more landslides to the area.

Climate change may also influence the geology of the land by worsening land subsidence, which occurs with excessive extraction of groundwater. Increased stress on groundwater supplies could result from longer and more intense droughts, increased evaporation, higher temperatures, and decreased precipitation and streamflow, all of which are expected to occur in the region. In 2017, the San Diego County Water Authority sourced 3 percent of its supplies from groundwater. However, it intends to double this number by 2035 in an attempt to diversify its supply portfolio (SDCWA 2016).

Wildfires and heavy storms can damage soil structure, decrease moisture retention, and increase soil erosion. These changes can especially harm topsoil, which is important to the health of crops and vegetation (County of San Diego 2018), and also remove soil that otherwise acts as carbon storage. Other effects of climate change, such as the warming of soils, may lead to higher decomposition rates, which release more carbon dioxide into the atmosphere (Melillo et al. 2014). However, the consequences of climate change on soils in the San Diego region have not yet been quantified.

Along the coast, sea-level rise in the region is expected to result in cliff erosion, further altering the geology. A projected increase in sea level of 1.6 to 6.6 feet along the Southern California coast could result in cliff retreats ranging from 62 to 135 feet by 2100 (Limber et al. 2018); those sea-level rise projections for all of Southern California are slightly higher than projections for just the San Diego region. Coastal bluff erosion rates vary depending on sea-level rise, wave energy, coastal slope, beach width and height, and rock strength. Marine erosion can be concentrated at points due to wave refraction, and occurs more quickly in weaker rocks (Johnsson 2003). The timing of coastal bluff retreat or collapse is also dependent on specific geologic conditions: it may occur catastrophically through sudden slope failure or more gradually through erosion by marine, subaerial, and groundwater processes (Johnsson 2003). In 2018, U.S. Geological Survey (USGS) researchers combined five different computer models that forecast how cliffs retreat, producing a range of values for each section of coastline instead of each model yielding one number, as shown in Figure 4.7-4 (Limber et al. 2018). A USGS research geologist noted that sea-level rise combined with coastal change, cliff retreat, and extreme storms could expose more than 250,000 residents and $50 billion in property to erosion or flooding in Southern California by the end of the century (USGS 2018).

One limit in the USGS study is that it does not factor in the linkage of long-term cliff retreat rates to annual landslide probabilities. Projected increases in extreme heat days, combined with decreased precipitation projected in the summer, can increase evaporation and the likelihood of drought and wildfires. Wildfires may precondition the landscape for cascading climate hazard events, with implications for both the proposed Plan and surrounding study area. For example, wildfires clear landscape and vegetation, which destabilizes the ground and can create hydrophobic soil (or water-repellant soil, due to the combustion of vegetative materials' resulting gas, which condenses and forms a waxy coating on the ground). In turn, hydrophobic soils increase the likelihood of a landslide during heavy precipitation events. Landslide sediments are often subjected to increased groundwater percolation, which tends to have a negative effect on the preservation of fossils, and gravitationally induced movements of sediment can also destroy fossil remains through abrasion and breakage. Further, when the original stratigraphic position of the sediments and fossils contained within are disturbed, there are varying degrees of scientific information loss with the severity of changes to the slide mass.

It is possible that sea-level rise, along with disaster events like flooding and wildfire, could damage paleontological resources. As with cultural resources, more intense and frequent wildfires and the fire recovery process could have negative impacts on resources within the zone (Waechter 2012). Impacts similar to those discussed under *Cultural Resources* could also adversely affect paleontological resources, although such impacts have not been discussed in the literature. For example, changes in temperature and precipitation could also damage paleontological resources by speeding deterioration and decay and causing thermal stress (Rockman et al. 2016). Additionally, heavy precipitation and flooding could cause erosion or direct damage to the resources. However, no studies investigate the extent to which paleontological resources could be affected by climate change.

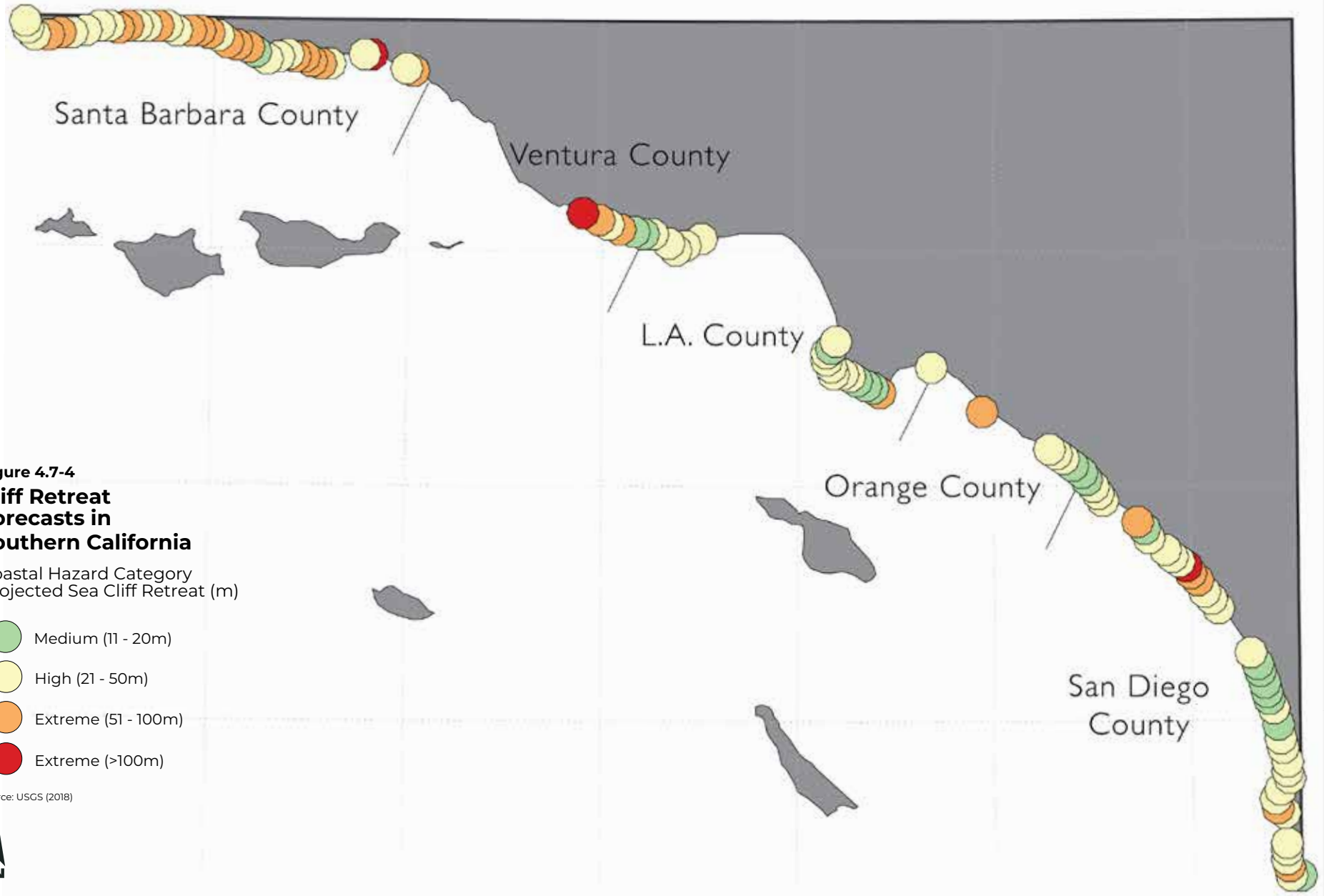


Figure 4.7-4

Cliff Retreat Forecasts in Southern California

4.7.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Earthquake Hazards Reduction Act

In 1977, Congress passed the Earthquake Hazards Reduction Act (EHRA, amended 2004) (Public Law 95-124) establishing the National Earthquake Hazards Reduction Program as a long-term earthquake risk reduction program for the United States. The program initially focused on research, led by the USGS and National Science Foundation (NSF), toward understanding and ultimately predicting earthquakes. The current program activities are focused on four broad areas:

- Developing effective measures to reduce earthquake hazards.
- Promoting the adoption of earthquake hazard reduction activities by federal, state, and local governments; national building standards and model building code organizations; and engineers, architects, building owners, and others who play a role in planning and constructing buildings, bridges, structures, and critical infrastructure or "lifelines."
- Improving the basic understanding of earthquakes and their effects on communities, buildings, structures and lifelines, through interdisciplinary research involving engineering, natural sciences, and social, economic, and decision sciences.
- Developing, operating, and maintaining the Advanced National Seismic Research and Monitoring System, the George E. Brown Jr. Network for Earthquake Engineering Simulation, and the Global Seismographic Network. (EHRA 1977)

U.S. Geological Survey Landslide Hazard Program

The USGS created the Landslide Hazard Program in fulfillment of the requirements of Public Law 106-113 (1999). The primary objective of the Program is to reduce long-term losses from landslide hazards by improving the understanding of the causes of ground failure and suggesting mitigation strategies. The federal government takes the lead role in funding and conducting this research, whereas the reduction of losses due to geologic hazards is primarily a state and local responsibility.

Antiquities Act of 1906

The Antiquities Act of 1906 (16 U.S. Code [USC] 431-433) states, in part:

> That any person who shall appropriate, excavate, injure or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall upon conviction, be fined in a sum of not more than five hundred dollars or be imprisoned for a period of not more than ninety days, or shall suffer both fine and imprisonment, in the discretion of the court.

Although there is no specific mention of natural or paleontological resources in the Act itself, or in the Act's uniform rules and regulations (Code of Federal Regulations Title 43, Part 3), the term "objects of antiquity" has been interpreted to include fossils by the National Park Service, the Bureau of Land Management, the Forest Service, and other federal agencies. Permits to collect fossils on lands administered by federal agencies are

authorized under this Act. However, due to the large gray areas left open to interpretation due to the imprecision of the wording, agencies are hesitant to interpret the Act as governing paleontological resources.

Archaeological and Paleontological Salvage

Archaeological and Paleontological Salvage Statute (23 USC 305) amends the Antiquities Act of 1906. Specifically, it states:

> Funds authorized to be appropriated to carry out this title to the extent approved as necessary, by the highway department of any State, may be used for archaeological and paleontological salvage in that state in compliance with the Act entitled "An Act for the preservation of American Antiquities," approved June 8, 1906 (Pub. L. 59-209; 16 USC 431-433), and State laws where applicable.

This statute allows funding for mitigation of paleontological resources recovered pursuant to federal aid highway projects, provided that "excavated objects and information are to be used for public purposes without private gain to any individual or organization" (46 *Federal Register* 19, 9570).

Paleontological Resources Preservation Act

The Paleontological Resources Preservation Act (PRPA)—Title VI, Subtitle D in the Omnibus Public Lands Act of 2009, Public Law 111-011—establishes that the Secretary of Interior and Secretary of Agriculture must manage and protect paleontological resources on federal land using scientific principles and expertise. With the passage of the PRPA, Congress officially recognized the importance of paleontological resources on federal lands (U.S. Department of the Interior, US Department of Agriculture) by declaring that fossils from federal lands are federal property that must be preserved and protected using scientific principles and expertise. The PRPA provides:

- Uniform definitions for "paleontological resources" and "casual collecting."
- Uniform minimum requirements for paleontological resource use permit issuance (terms, conditions, and qualifications of applicants).
- Uniform criminal and civil penalties for illegal sale and transport, and theft and vandalism of fossils from Federal lands.
- Uniform requirements for curation of federal fossils in approved repositories.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

Alquist-Priolo Earthquake Fault Zoning Act

The purpose of the Alquist-Priolo Earthquake Fault Zoning Act of 1972 (renamed in 1994), Public Resources Code Section 2621 et seq., is "to regulate development near active faults so as to mitigate the hazard of surface fault rupture." The State Geologist, Chief of the Division of Mines and Geology (DMG), is required to delineate Earthquake Fault Zones (formerly known as "Special Studies Zones") along known active faults. As defined by the DMG, an active fault is one that has had surface displacement within Holocene time (roughly the last 11,000 years) and/or has an instrumental record of seismic activity. Potentially active faults are those that show evidence of surface displacement during Quaternary time (roughly the last 2 million years), but for which evidence of Holocene movement has not been established. The DMG evaluates faults on an individual basis to determine if a fault will be classified as an Alquist-Priolo Earthquake Fault Zone. In general, faults must meet

certain DMG criteria, including seismic activity, historic rupture, and geologic evidence to be zoned as an Earthquake Fault Zone. Cities and counties affected by the zones must regulate certain development within the zones. They must withhold development permits for sites within the zones until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting. Typically, structures for human occupancy are not allowed within 50 feet of the trace of an active fault. If a property within a zone is not currently developed, a fault study may be required prior to the subdivision of the property or prior to any structure being permitted on the property.

Seismic Hazards Mapping Act of 1990

The Seismic Hazards Mapping Act (SHMA) of 1990 (Public Resources Code Section 2690–2699.6) directs the California Geological Survey to identify and map areas prone to earthquake hazards of liquefaction, earthquake-induced landslides, and amplified ground shaking. The purpose of the SHMA is to reduce the threat to public safety and to minimize the loss of life and property by identifying and mitigating these seismic hazards. The SHMA was passed by the legislature following the 1989 Loma Prieta earthquake. Staff geologists in the Seismic Hazard Mapping Program gather existing geological, geophysical and geotechnical data from numerous sources to compile the Seismic Hazard Zone Maps. They integrate and interpret these data regionally to evaluate the severity of the seismic hazards and designate Zones of Required Investigation for areas prone to liquefaction and earthquake-induced landslides and determine whether structural design or modification of the project site is necessary to ensure safer development. Site-specific geotechnical investigations are conducted to identify and evaluate seismic hazards and formulate mitigation measures prior to permitting most development designed for human occupancy. Cities and counties are then required to use the Seismic Hazard Zone Maps in their land use planning and building permit processes .

California Building Code

Chapter 16A, Division IV of the California Building Code (CBC), titled "Structural Design," states that the "purpose of the earthquake provisions herein is primarily to safeguard against major structural failures or loss of life." The CBC regulates the design and construction of excavations, foundations, building frames, retaining walls, and other building elements to mitigate the effects of seismic shaking and adverse soil conditions. The procedures and limitations for the design of structures are based on site characteristics, occupancy type, configuration, structural system height, and seismic zoning. Seismic zones are mapped areas that are based on proximity to known active faults and the potential for future earthquakes and intensity of seismic shaking. Seismic zones range from 0 to 4, with areas mapped as Zone 4 being potentially subject to the highest accelerations due to seismic shaking and the shortest recurrence intervals. According to the CBC, the entire San Diego region is within seismic Zone 4.

The CBC also contains (1) specific provisions to classify soils as expansive, (2) exploratory boring procedures, (3) soil boring reporting procedures, and (4) special building foundation and investigation requirements. Section 1613A.1 describes earthquake loads and states that "every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions." Additionally, structures that require special consideration of their response characteristics and environment that are not addressed by this code and for which other regulations provide seismic criteria include vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors (CBC 2016).

Construction General Permit

Dischargers whose projects disturb 1 or more acres of soil, or less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the SWRCB's Order 2009-0009-DWQ (as amended by Orders 2010-0014-DWQ and 2012- 0006-DWQ), the Construction General Permit (SWRCB 2009). Construction and demolition activities subject to this permit include clearing, grading, grubbing, and excavation, or any other activity that results in a land disturbance equal to or greater than one acre.

Permit applicants are required to submit a Notice of Intent to the SWRCB and to prepare a Storm Water Prevention Pollution Plan (SWPPP). The SWPPP must identify BMPs that are to be implemented to reduce construction impacts on receiving water quality based on potential pollutants. The SWPPP also must include descriptions of the BMPs to reduce pollutants in stormwater discharges after all construction phases are completed at a site (post-construction BMPs). The Construction General Permit also includes requirements for risk-level assessment for construction sites, a stormwater effluent monitoring and reporting program, rain event action plans, and numeric action levels for pH and turbidity.

California Coastal Act

The California Coastal Act (Public Resources Code Section 30253) provides for the minimization of adverse impacts, including assuring stability and structural integrity, and neither creating nor contributing significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way requiring the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. The California Coastal Commission has found that siting new development away from eroding bluffs is the preferred means of assuring compliance with this section of the Act so developments will not be endangered by erosion nor require the construction of coastal armoring to protect them from erosion over their design life (Johnsson 2003).

Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems

On June 19, 2012, the SWRCB adopted Resolution No. 2012-0032, adopting the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of OWTS Policy. This Policy establishes a statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements and sets the level of performance and protection expected from OWTS (SWRCB 2012).

In accordance with Water Code Section 13290 et seq., the Policy sets standards for OWTS that are constructed or replaced, that are subject to a major repair, that pool or discharge waste to the surface of the ground, and that have affected, or will affect, groundwater or surface water to a degree that makes it unfit for drinking water or other uses or cause a health or other public nuisance condition. The OWTS Policy also includes minimum operating requirements for OWTS that may include siting, construction, and performance requirements; requirements for OWTS near certain waters listed as impaired under Section 303(d) of the Clean Water Act; requirements authorizing local agency implementation of the requirements; corrective action requirements; minimum monitoring requirements; exemption criteria; requirements for determining when an existing OWTS is subject to major repair; and a conditional waiver of waste discharge requirements.

On April 15, 2015, the San Diego Regional Water Quality Control Board (RWQCB) adopted a Basin Plan amendment that changed water quality objectives for nitrate in groundwater basins. The Basin Plan Amendment also incorporates the State Water Quality Control Policy for Siting, Designing, Operation, and Maintenance of Onsite Wastewater Treatment Systems and made updates related to implementation of waste discharge requirements and adopted resolutions (Gorham 2015). The Basin Plan Amendment incorporates the OWTS Policy into the Basin Plan and amends the criteria to be used by the San Diego Water Board and local agencies to regulate OWTS in the San Diego region (San Diego RWQCB 2015).

State Laws Protecting Paleontological Resources

Public Resources Code Sections 5097 and 30244 include state-level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts on paleontological resources resulting from development on State lands, and define the excavation, destruction, or removal of paleontological "sites" or "features" from public lands without the express permission of the jurisdictional agency as a misdemeanor. As used in Section 5097, *State lands* refer to lands owned by, or under the jurisdiction of, the State or any State agency. *Public lands* is defined as lands owned by, or under the jurisdiction of, the State, or any city, county, district, authority, or public corporation, or any agency thereof.

Conservation and Safety Elements

Under Government Code Section 65302(d)(1), a general plan must include "[a] conservation element for the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources". Under Government Code Section 65302(g)(1) a general plan must include "[a] safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence; liquefaction; and other seismic hazards…, and other geologic hazards known to the legislative body...The safety element shall include mapping of known seismic and other geologic hazards." The cities and County government within the San Diego region include these elements within their general plans, and most contain additional information on disaster relief and emergency preparedness for geologic and seismic hazards.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

County Septic Tank Regulations

The San Diego RWQCB authorizes the County of San Diego Department of Environmental Health to issue septic system (OWTS) permits throughout the San Diego region. The purpose of regulating the design, installation, and maintenance of septic systems is to prevent public health nuisance conditions caused by failing septic systems. The program's goals are as follows:

- Ensure that these systems can operate in all weather conditions with minimal maintenance.
- Prevent the contamination of groundwater from improperly designed onsite wastewater treatment systems.
- Prevent the contamination of surface water from improperly designed onsite wastewater treatment systems.

- Prevent premature failure of onsite wastewater treatment systems (DEH 2015).

Grading and Erosion Regulations

Consistent with State law, local jurisdictions contain grading and erosion control regulations in their municipal codes. These regulations establish minimum requirements for grading, including clearing and grubbing of vegetation. These regulations ensure compatibility of graded land development sites with surrounding land forms and land uses; and prevent unnecessary and unauthorized grading.

Additionally, Local jurisdictions have grading and erosion control ordinances that are intended to control erosion and sedimentation caused by construction activities. A grading permit is typically required for construction-related projects. As part of the permit, project applicants usually must submit a grading and erosion control plan, vicinity and site maps, and other supplemental information. Standard conditions in the grading permit include a description of BMPs similar to those contained in a SWPPP.

Seismic Standards

Many geologic and seismic hazard goals, policies, and mitigation measures are listed in the safety elements of local general plans, and aim to minimize injury, loss of life, and damage to property resulting from potential geologic and seismic disasters. For example, the San Diego County General Plan Safety Element contains goals and policies to minimize personal injury and property damage resulting from seismic hazards (County of San Diego 2011a).

Additionally, the Alquist-Priolo Earthquake Fault Zoning Act, described above, requires that before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that proposed buildings will not be constructed across active faults (Alquist-Priolo 1972).

County of San Diego, Grading Ordinance

Section 87.430 of the Grading Ordinance states that a qualified paleontologist may be required by the County Official to be present during all grading activities for monitoring purposes. If a fossil greater than 12 inches in any diameter is found, all grading operations must be suspended and the County Official must be notified immediately. The County Official will analyze the resource and determine the proper course of action, to be carried out by the permittee, prior to the County Official's authorization to resume normal grading operations.

Local Jurisdictions' Protection Policies for Protecting Against Geologic and Seismic Hazards

To comply with Government Code Section 65302, a general plan must include "A safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence; liquefaction; and other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code, and other geologic hazards known to the legislative body… The safety element shall include mapping of known seismic and other geologic hazards." (GCS 65302 (g)). The incorporated cities and County government within San Diego region contain safety elements within their general plans, and most contain additional information on disaster relief and emergency preparedness for geologic and seismic hazards.

Selected local government policies related to safety and geological hazards are listed in Table 4.7-3.

Table 4.7-3
Local Policies Concerning Geologic and Seismic Hazards

Jurisdiction	Policies
Carlsbad	The Public Safety Element of the Carlsbad General Plan does not contain policies specific to geologic hazards. The General Plan for Carlsbad references Chapter 18.07 of the Carlsbad Municipal Code which establishes guidelines for the seismic upgrade of unreinforced masonry buildings.
Chula Vista	The Environment Element of the Chula Vista General Plan contains Policy E 14.1 through E 14.5 to protect against injury, loss of life, and major property damage through engineering analyses of potential seismic hazards; prohibit subdivision, grading, or development of lands subject to potential geologic hazards; require site-specific geotechnical investigations; promote programs to identify buildings and structures that would be at risk during seismic events; and to discontinue, remove, or relocate structures determined to be unsafe from geologic hazards.
Coronado	The Safety Element of the Coronado General Plan contains goals and policies related to fault zone development, inundation hazard from tsunami or seiche, an emergency warning system, and public education for disaster preparedness.
Del Mar	The Environmental Constraints Section of the Del Mar Community Plan contains discussion about floodplain overlay and bluff, slope, and canyon overlay zones used by the City to protect the public safety and welfare from hazards such as fire, flooding, landslides, and erosion. The Safety Element of the Community Plan also contains the Sea Level Rise Adaptation Plan, which is intended to guide policy decisions related to future development in areas that are identified as vulnerable to projected sea-level rise, flooding, and erosion. In addition, the City of Del Mar's Municipal Code contains the City's Local Coastal Program Implementing Ordinances related to geology and soils. Specifically, Del Mar Municipal Code Chapter 30.52, Bluff, Slope, Canyon Overlay Zone, is designed to protect the health, safety, and general welfare, and to protect downstream resources. Del Mar Municipal Code Chapter 30.55, Coastal Bluff Overlay Zone, is intended to protect Del Mar's fragile coastal bluffs as a visual resource and avoid the risks to life and property associated with bluff failure and shoreline erosion. Del Mar Municipal Code Chapter 30.56, Floodplain Overlay Zone, is intended to avoid hazards related to flood hazards. Finally, Del Mar Municipal Code Chapter 23.33, Land Conservation Ordinance, which regulates soil disturbances of existing or natural terrain and vegetation, and does not create soil erosion, silting of lower slopes, slide damage, flooding problems, or severe cutting or scarring.
El Cajon	The Safety Element of the City of El Cajon General Plan includes discussion regarding fault zones and surface ruptures, ground shaking and failure, flooding, and disaster preparedness as it relates to the city.
Encinitas	The Public Safety Element of the Encinitas General Plan contains policies to prevent and respond to geologic hazards.
Escondido	The Community Protection Element of the Escondido General Plan contains goals and policies including Policy 7.1 through Policy 7.5 to minimize adverse effects to residents, property, and critical facilities caused by geologic and seismic hazards.

Jurisdiction	Policies
Imperial Beach	The Safety Element of the City of Imperial Beach General Plan and Local Coastal Plan contain policies specific to geologic hazards including Policy S-1 which requires geo-technical investigations and recommendations; Policy S-5 which restricts construction near fault traces; and Policy S-6 which restricts cliff top development.
La Mesa	The Safety Element of the La Mesa General Plan contain goals, objectives, and policies to offer protection from risks associated with geologic and seismic hazards.
Lemon Grove	The Safety Element of the Lemon Grove General Plan contains Policies 1.1, 1.2, and 1.3 to minimize risk of injury and property from seismic and other geologic conditions.
National City	The Safety Element of the National City General Plan contains Policies S-1.1 through S-1.7, to minimized risk to the community from earthquakes, seismic, and geologic hazards.
Oceanside	The Public Safety Element of the Oceanside General Plan contains goals and objectives to ensure an acceptable level of public safety for prevention and reduction of loss of life and personal property at risk from seismic and geologic hazards.
Poway	The Emergency Services Element of the City of Poway General Plan contains Policy B to protect against hazards associated with geologic formations through proper land use policies and mitigation, and Policy C to control seismic hazards to a level of acceptable risk through the identification and recognition of potentially hazardous conditions and areas.
City of San Diego	The Public Facilities, Services, and Safety Element of the City of San Diego General Plan includes Policy PF-Q.1 to protect public health and safety through the application of effective seismic, geologic and structural considerations. Policy PF-Q.2 maintains or improves the integrity of structures to protect residents and preserve communities.
San Marcos	The Safety Element of the City of San Marcos General Plan includes Policy S-1.1 which reduces the risk of impacts from geologic and seismic hazards by applying current and proper land use planning, development engineering, building construction, and retrofitting requirements. Policy S-1.2 includes the investigation specific groundwater levels and geologic conditions underlying all new development or redevelopment proposals in areas where potential fault rupture, liquefaction, or other geologic hazards are suspected.
Santee	The Safety Element of the Santee General Plan includes Policies 2.1, 2.2, and 2.3 which minimize the loss of life and destruction of property in Santee caused by seismic and geologic hazards.

Jurisdiction	Policies
Solana Beach	The Safety Element City of Solana Beach General Plan contains Objective 1.0 to ensure that geologic hazards in all areas for human use or habitation are mitigated properly or avoided prior to or during development. Policies 1.a through 1.e require geo-technical investigations; review of geotechnical reports; require construction to be in conformance with the Uniform Building Code; increased awareness of seismic and geologic hazards; and encourage programs to abate or modify structures deemed hazardous to human habitation. In addition, Chapter 4, Sections 1 through 4, of the Solana Beach Local Coastal Program Land Use Plan includes policies to minimize risks related to life and property from geologic, flood, or fire hazards; shoreline management strategies; shoreline erosion and protection; and beach sand replenishment and retention.
Vista	The Public Safety, Facilities, and Services Element of the City of Vista General Plan contains PSFS Goal 3 to reduce damage, losses, and the risk to the community caused by seismic and other geologic hazards. The General Plan contains PSFS Policies 3.1 through 3.9 to minimize geologic hazard risks.
County of San Diego	The San Diego County General Plan ~~includes~~ Goal S-8~~7~~ and S-9 in the Safety Element~~, which~~ require~~s~~ minimized personal injury and property damage resulting from seismic hazards, and damage caused by mudslides, landslides, or rock falls.

Sources: City of Carlsbad 2015, City of Chula Vista 2020, City of Coronado 2003, City of Del Mar 1985, City of El Cajon 2001, City of Encinitas 2012, City of Escondido 2012, City of La Mesa 2013, City of Lemon Grove 1995, City of National City 2011, City of Oceanside 2002, City of San Diego 2015, City of Santee 2003, City of Solana Beach 2014, City of Vista 2014, County of San Diego 2020.

Local Jurisdictions' Protection Policies for Unique Geological and Paleontological Features

Selected local government policies protecting unique geological and paleontological features are listed in Table 4.7-4.

Table 4.7-4
Local Policies Concerning Unique Geological and Paleontological Features

Jurisdiction	Policies
Carlsbad	The Open Space and Conservation Element of the Carlsbad General Plan contains Policy B.3, which preserves areas of unique scenic, historical, archaeological, paleontological, and cultural value, and where possible, provides public access to these areas; and Policy B.7, which minimizes impacts from new development on hillsides, ridges, valleys, canyons, lagoons, beaches and other unique resources that provide visual and physical relief to the cityscape. The General Plan for Carlsbad is being updated as of January 2015; however, these policies will be unaffected according to the draft document.
Chula Vista	The Environment Element of the Chula Vista General Plan contains Policy E 10.1 to continue to assess and mitigate the potential impacts of private development and public facilities and infrastructure on paleontological resources in accordance with the California Environmental Quality Act.
Coronado	The Conservation Element of the Coronado General Plan contains objectives to preserve the shoreline from erosion.

Jurisdiction	Policies
Del Mar	The Del Mar Community Plan contains objectives to preserve the integrity of the coastal bluffs and prevent erosion on steep slopes. The Bluff, Slope, and Canyon Specific Plan provides the implementation strategy to protect these natural resources. In addition, Del Mar Municipal Code Chapter 30.52, Bluff, Slope, Canyon Overlay Zone, is designed to protect the health, safety, and general welfare, and to control the development of properties within the designated zone in order to preserve the scenic sandstone bluffs and related canyons and steep slopes that characterize the area within the zone; and Chapter 30.60, Open Space Overlay Zone, is intended, in part, to preserve scenic vistas and particularly unique natural features in specific neighborhoods.
El Cajon	The City of El Cajon General Plan does not contain policies or regulations specific to unique geological features.
Encinitas	The Resource Management Element of the Encinitas General Plan contains policies to document and preserve paleontological resources.
Escondido	The Land Use and Community Form and Resource Conservation Elements of the Escondido General Plan contain policies to conserve hillsides, ridgelines, and paleontological resources.
Imperial Beach	The City of Imperial Beach General Plan and Local Coastal Plan does not contain policies or regulations specific to unique geological features or landforms.
La Mesa	The Conservation and Sustainability Element and Recreation and Open Space Element of the La Mesa General Plan contain policies and conservation objectives to protect natural landforms and significant physical features.
Lemon Grove	The Conservation and Recreation Element of the Lemon Grove General Plan contains Policy 2.1, which protects significant fossils and prehistoric artifacts from development impacts.
National City	The Open Space and Agriculture Element of the National City General Plan contains Policy OS-1.1, which protects and conserves the landforms and open spaces that define the city's urban form, provide public views/vistas, serve as core biological areas and wildlife linkages, or are wetland habitats; and Policy OS-8.8, which requires monitoring for sub-surface cultural and paleontological resources during grading and construction activities for all development projects.
Oceanside	The Environmental Resource Management Element of the Oceanside General Plan contains implementation strategies and policies for reducing erosion and other environmentally damaging impacts.
Poway	The Natural Resources Element of the City of Poway General Plan and the City of Poway's Habitat Conservation Plan ~~does not~~ contains descriptions of unique geological features and landforms and related policies that include the preservation of rock outcroppings, open space, hillsides, ridgelines, and cultural, historical, and paleontological resources. ~~contain policies or regulations specific to unique geological features or landforms.~~
City of San Diego	The Conservation Element of the City of San Diego General Plan includes the goal for the preservation and long-term management of the natural landforms and open spaces that help make San Diego unique. Policy CE-B.1 protects and conserves important landforms, canyon lands, and open spaces.

Jurisdiction	Policies
San Marcos	The City of San Marcos General Plan, in the Conservation Element, includes Policies COS-2.4 and COS-2.5, which preserve prominent landforms through conservation and management policies. Implementing strategies establish provisions for limiting environmental impacts on landforms, reducing erosion and runoff, and utilizing techniques for open space conservation.
Santee	The Santee General Plan includes Policy 1.1, which encourages significant natural landforms to be maintained during development whenever possible, and Policy 10.2, which encourages the preservation of significant natural features, such as watercourses, ridgelines, steep canyons, and major rock outcroppings through the Development Review process.
Solana Beach	The City of Solana Beach Municipal Code contains Objective 2.0 to preserve the city's hillside areas and natural landforms in their present state to the greatest extent possible. As of January 2015, the City of Solana Beach is in the process of updating its general plan, which may lead to new or different policies regarding unique geological and paleontological features.
Vista	The City of Vista General Plan contains RCS Goals 11, 12, and 13 to provide for the protection of cultural, historical, and paleontological resources. The General Plan also contains provisions to protect important geological features.
County of San Diego	The San Diego County General Plan includes Goal COS-9 in the Conservation and Open Space Element, which requires the conservation of unique geologic features. Policy COS-9.1 requires the salvage and preservation of unique paleontological resources when exposed to the elements during excavation or grading activities or other development processes. Policy COS-9.2 requires future development to minimize impacts on unique geologic features.

Sources: City of Carlsbad 2015, City of Chula Vista 2020, City of Coronado 2003, City of Del Mar 1985, City of El Cajon 2001, City of Encinitas 2012, City of Escondido 2012, City of La Mesa 2013, City of National City 2011, City of Oceanside 2002, City of San Diego 2015, City of Santee 2003, City of Solana Beach 2014, City of Vista 2014, County of San Diego 2020.

4.7.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts, in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the checklist questions that address the criteria in CEQA Guidelines Appendix G. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR and the unique characteristics of the proposed Plan and EIR.

Checklist questions for geology and soils are found in Section VII of the CEQA Guidelines. Sections that have been combined and modified are criterion VII(c) related to project location on unstable geologic units or soils and criterion VII(d) related to project location on expansive soils, which are combined as GEO-2 herein.

For the purposes of this EIR, implementation of the proposed Plan would have a significant geologic or soils, impact if it would:

GEO-1 Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area, or based on other substantial evidence showing an earthquake fault is active;
- Strong seismic ground shaking;
- Seismic-related ground failure, including liquefaction; and
- Landslides.

GEO-2 Locate projects on a geologic unit or soil that is expansive or unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse, creating substantial direct or indirect risks to life or property.

GEO-3 Result in substantial soil erosion or the loss of topsoil.

GEO-4 Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater, potentially causing adverse groundwater impacts.

PALEO-1 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

4.7.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

GEO-1 DIRECTLY OR INDIRECTLY CAUSE POTENTIAL SUBSTANTIAL ADVERSE EFFECTS, INCLUDING THE RISK OF LOSS, INJURY, OR DEATH INVOLVING:

- **RUPTURE OF A KNOWN EARTHQUAKE FAULT, AS DELINEATED ON THE MOST RECENT ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING MAP ISSUED BY THE STATE GEOLOGIST FOR THE AREA, OR BASED ON OTHER SUBSTANTIAL EVIDENCE SHOWING AN EARTHQUAKE FAULT IS ACTIVE;**
- **STRONG SEISMIC GROUND SHAKING;**
- **SEISMIC-RELATED GROUND FAILURE, INCLUDING LIQUEFACTION; AND**
- **LANDSLIDES.**

ANALYSIS METHODOLOGY

This analysis acknowledges that the entire San Diego region is subject to strong groundshaking during an earthquake on a fault or fault zone inside or outside of the region. It identifies the location of forecasted regional growth and land use change and planned transportation network improvements as part of the proposed Plan in relation to known earthquake faults in the San Diego region, including Alquist-Priolo Earthquake Fault Zones. This analysis also identifies the location of forecasted regional growth and land use change or planned transportation network improvements in relation to areas subject to seismic-related ground failure, including liquefaction, and seismically induced landslides. The analysis then qualitatively discusses the potential to directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving earthquakes and related seismic hazards as a result of forecasted development and planned transportation network improvements. Finally, the analysis assesses the ability of specific requirements of existing laws and

regulations (as described in the regulatory setting) to minimize any substantial adverse direct or indirect effects.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, the region is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). Approximately 79 percent of the forecasted regional population increase between 2016 and 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent).

As shown in Figure 4.7-2, several active fault lines and Alquist-Priolo Earthquake Fault Zones are located in areas that are currently developed and that are forecasted to develop between 2016 and 2025. Areas that contain or are in proximity to Alquist-Priolo Earthquake Fault Zones include downtown San Diego, Coronado, and communities along I-5 from I-8 to SR 52. Additionally, several earthquake fault lines are located in the western third of the region. New development and infrastructure planned to occur between 2016 and 2025 would increase the number of people and structures located in or near areas containing Alquist-Priolo Earthquake Fault Zones, earthquake fault lines, and other geologic hazards. Earthquakes within 60 miles of the San Diego region are capable of generating strong ground shaking. This ground shaking could be generated along the San Clemente, San Diego Trough, Coronado Bank, Rose Canyon, Elsinore, San Jacinto, and Sweetwater fault zones. Surface rupture and severe ground shaking could cause catastrophic damage to new development associated with implementation of the proposed Plan, including catastrophic damage to structures.

As described above in Section 4.7.1, *Existing Conditions,* Area 4 landslide susceptibility zones are scattered throughout the region. Additionally, areas prone to liquefaction also occur throughout the region. Some of these liquefaction and landslide susceptible areas are located in developed areas and areas that are forecasted to develop as a result of regional growth and land use change between 2016 and 2025. Therefore, implementation of the proposed Plan would expose people and structures to the adverse effects of landslides and liquefaction.

Earthquakes and related seismic hazards, such as landslides and liquefaction, can lead to indirect effects such as fires. Long-term effects associated with earthquakes include phenomena such as regional subsidence or emergence of landmasses and regional changes in groundwater level. As a result of forecasted regional growth and land use change, the proposed Plan would increase the risk of loss, injury, or death associated with earthquakes and seismic hazards.

Earthquake-resistant designs employed on new structures can minimize the impact on public safety from seismic events. As discussed in Section 4.7.2, *Regulatory Setting*, there are numerous federal, State, and local laws, regulations, and programs in place to avoid or reduce impacts from earthquakes and other geologic hazards. The Alquist-Priolo Earthquake Fault Zoning Act, described in Section 4.7.2, requires that before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that proposed buildings will not be constructed across active faults. An evaluation and written report of a specific site must be prepared by a licensed geologist, and if an active fault is found, a structure for human occupancy cannot be placed over the fault and must be set back, generally 50 feet from the fault.

All projects would be required to adhere to standard design, grading, and construction practices described in the California Building Code, which regulates the design and construction of excavations, foundations, building frames, retaining walls, and other building elements. This along with all other standard geotechnical investigation, design, grading, and construction standards and practices would mitigate the effects of seismic shaking and adverse soil conditions and avoid or reduce impacts from earthquakes, ground shaking, ground failure, and landslides. Adherence to the Seismic Hazards Mapping Act would reduce threats to public safety by identifying and mitigating for seismic hazards.

Regulatory agencies with oversight on development associated with the proposed Plan have developed regulations and engineering design specifications to consider and compensate for site-level geological and seismic conditions. Adherence to these laws and regulations would ensure impacts from land use changes between 2016 and 2025 would not expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure including liquefaction, or seismically induced landslides. Therefore, this impact is less than significant.

Transportation Network Improvements and Programs

Major transportation network improvements between 2016 and 2025 include new Managed Lanes on I-5 from Manchester Avenue to Vandegrift; new toll lanes on SR 11 to the Otay Mesa Port of Entry (POE); Interchange and Arterial Operational improvements at SR 94 and SR 125, and the Otay Mesa POE Commercial Vehicle Enforcement Facility (CVEG); and tolling equipment and Regional Border Management System investments on SR 11. Other major network improvements include double-tracking at certain locations on the Los Angeles–San Diego–San Luis Obispo (LOSSAN) rail corridor, along with a station addition in the Gaslamp Quarter, San Diego.

The majority of improvements by 2025 would be located in proximity to several fault lines and Alquist-Priolo Earthquake Fault Zones, which would result in increased exposure of people and structures to risk of loss, injury, or death from earthquakes and other geologic hazards. Specific transportation facilities that would be most at risk for damage from seismic effects include those in downtown San Diego and improvements along the I-5 and SR 94 corridors. Due to historic activity of faults in the region, the potential for surface rupture and ground-shaking remains.

As described above in Section 4.7.1, Area 4 landslide susceptibility zones are scattered throughout the region. Additionally, areas prone to liquefaction also occur throughout the region. Some of these liquefaction and landslide susceptible areas are located in areas in which transportation network improvements are planned between 2016 and 2025; therefore, implementation of the proposed Plan would expose people and structures to the adverse effects of landslides and liquefaction.

As discussed above, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 would require each improvement or project to be reviewed by appropriate regulatory agencies prior to construction and would require each improvement or project to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce impacts from geologic hazards. Adherence to these laws and regulations would ensure impacts from transportation network improvements in place between 2016 and 2025 would not expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic

ground shaking, seismic-related ground failure including liquefaction, or seismically induced landslides. Therefore, this impact is less than significant.

2025 Conclusion

By 2025, implementation of the proposed Plan would result in land use changes and the construction of transportation network improvements that would expose a greater number of people and structures to impacts from seismic activity, including earthquakes, ground shaking, ground failure, and landslides. However, adherence to the laws, regulations, and programs included in Section 4.7.2 would ensure people or structures would not be exposed to substantial adverse effects, and these impacts would therefore be less than significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, the region is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent).

Growth between 2026 and 2035 would be more susceptible to seismic activity than growth between 2016 and 2025 as more development and redevelopment activities would be located in areas in proximity to Alquist-Priolo Earthquake Fault Zones, such as downtown San Diego and nearby coastal communities and Area 4 landslide susceptibility zones scattered throughout the region. Some of these liquefaction and landslide susceptible areas are located in developed areas and areas that are forecasted to develop as a result of regional growth and land use change between 2026 and 2035. Implementation of the proposed Plan would expose people and structures to the adverse effects of landslides and liquefaction. As stated in the 2025 analysis, seismic activity can lead to indirect effects such as fires.

As discussed in the 2025 analysis, existing federal, State, and local laws, regulations, programs, and ordinances included in Section 4.7.2 would require new structures to adhere to design standards described in the Uniform Building Code and CBC and ensure impacts from seismic activity and other geologic hazards would not expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure including liquefaction, or seismically induced landslides. Therefore, this impact is less than significant.

Transportation Network Improvements and Programs

The transportation network improvements that would be implemented between 2026 and 2035 include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, SR 125, I-5, I-8, I-15, and I-805. Double-tracking of the LOSSAN rail corridor will continue between 2026 and 2035. During this period, two intermodal transit center Mobility Hub projects will be constructed: the Central Mobility Hub (CMH) in downtown San Diego and the San Ysidro Mobility Hub (SYMH) at the U.S.-Mexico border.

Similar to the 2025 analysis, many of these improvements would be located in areas containing Alquist-Priolo Earthquake Fault Zones and other earthquake fault lines, such as improvements located near downtown San Diego. Given the location of these improvements, additional people or structures would be at risk of loss, injury, or death from earthquakes and other geologic hazards.

As discussed above, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 would require each improvement or project to be reviewed by appropriate regulatory agencies prior to construction and would require each improvement or project to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce impacts from geologic hazards. Adherence to these laws and regulations would ensure impacts would not expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure including liquefaction, or seismically induced landslides. Therefore, this impact is less than significant.

2035 Conclusion

Between 2016 and 2035, implementation of the proposed Plan would result in land use changes and the construction of transportation network improvements that would expose a greater number of people and structures to impacts from seismic activity, including earthquakes, ground shaking, ground failure, and landslides. However, adherence to the laws, regulations, and programs included in Section 4.7.2 would ensure people or structures would not be exposed to substantial adverse effects, and these impacts would therefore be less than significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, the region is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent). Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), San Marcos (13 percent), and City of Chula Vista (28 percent).

As discussed in the 2025 and 2035 analyses above, regional growth and land use change resulting in the construction of new and redeveloped buildings would result in significant impacts regarding the exposure of people and structures to seismic activity, including earthquakes, ground shaking, ground failure, and landslides. As stated above, seismic activity can also have indirect effects such as fires. This risk would continue to occur into 2050 as development intensities increase and infrastructure is extended to accommodate forecasted growth. Land use changes by 2050 would result in an increase in regional growth and development, and as shown on Figure 4.7-1, some of this development would occur near an earthquake fault zone. Population and housing in 2050 are located in or near earthquake fault zones. Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), which lies in the Rose Canyon fault zone.

As described in Section 4.7.1, Area 4 landslide susceptibility zones are scattered throughout the region. Additionally, areas prone to liquefaction also occur throughout the region as shown on Figure 4.7-2. Some of these liquefaction and landslide susceptible areas are located in developed areas and areas that are forecasted to develop as a result of regional growth and land use change between 2036 and 2050. Implementation of the proposed Plan would expose people and structures to the adverse effects of landslides and liquefaction.

As discussed in the 2025 and 2035 analyses, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 would require new structures to adhere to design standards described in the CBC; therefore, regional growth and land use change between 2036 and 2050 would not expose people or structures

to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure including liquefaction, or seismically induced landslides. Therefore, this impact is less than significant.

Transportation Network Improvements and Programs

Major transportation network improvements between 2036 and 2050 include new Managed Lanes and Managed Lane Connectors on SR 52, SR 56, SR 54, SR 125, and SR 905 and on I-5, I-8, I-15, and I-805. Double-tracking at certain locations on the LOSSAN rail corridor would continue during this period. Three major new commuter rail lines will be constructed, including routes between Downtown San Diego and El Cajon (Route 581), National City to the U.S. Border (Route 582 [Extension]), and the CMH to the U.S. Border (Route 583). Improvements also include double-tracking of the SPRINTER, Green Line, and Orange Line. Double-tracking and grade separations on the Blue Line also are included.

Similar to the 2025 and 2035 analyses, some of the improvements would be located in areas containing Alquist-Priolo Earthquake Fault Zones and other earthquake fault lines including the Rose Canyon, Coronado, Sweetwater, and La Nacion fault lines. In these areas, additional people or structures would be at risk of loss, injury, or death from earthquakes and other geologic hazards.

As described in Section 4.7.1, Area 4 landslide susceptibility zones are scattered throughout the region. Additionally, areas prone to liquefaction also occur throughout the region as shown on Figure 4.7-2. Some of these liquefaction and landslide susceptible areas are located in developed areas and areas that are forecasted to develop as a result of transportation network improvements between 2036 and 2050; therefore, implementation of the proposed Plan would expose people and structures to the adverse effects of landslides and liquefaction.

As discussed above, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 would require each improvement or project to be reviewed by appropriate regulatory agencies prior to construction and would require each improvement or project to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce impacts from geologic hazards. Adherence to these laws and regulations would ensure that the proposed transportation network improvements would not expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure including liquefaction, or seismically induced landslides. Therefore, the impact is less than significant.

2050 Conclusion

Between 2036 and 2050, implementation of the proposed Plan would result in land use changes and the construction of transportation network improvements that would expose a greater number of people and structures to impacts from seismic activity, including earthquakes, ground shaking, ground failure, and landslides. However, adherence to the laws, regulations, and programs included in Section 4.7.2 would ensure people or structures would not be exposed to substantial adverse effects, and these impacts would therefore be less than significant. For this reason, no mitigation is required.

Exacerbation of Climate Change Effects

During the timeframe of the proposed Plan, climate change effects include, but are not limited to, sea-level rise, more frequent and severe precipitation events, higher temperatures, and higher incidence of wildfire. As described in Section 4.7.1, these conditions can increase the likelihood of landslides. Sea-level rise and extreme storms can increase coastal change and cliff retreat, causing further ground instability. Implementation of the proposed Plan, because of adherence to the laws, regulations, and programs included in Section 4.7.2, would not exacerbate climate change effects such as increased landslides and cliff retreat.

GEO-2 LOCATE PROJECTS ON A GEOLOGIC UNIT OR SOIL THAT IS EXPANSIVE OR UNSTABLE, OR THAT WOULD BECOME UNSTABLE AS A RESULT OF THE PROJECT, AND POTENTIALLY RESULT IN ON- OR OFF-SITE LANDSLIDE, LATERAL SPREADING, SUBSIDENCE, LIQUEFACTION OR COLLAPSE, CREATING SUBSTANTIAL DIRECT OR INDIRECT RISKS TO LIFE OR PROPERTY.

ANALYSIS METHODOLOGY

This analysis identifies the location of forecasted regional growth and land use change or planned transportation network improvements in relation to geologic units and soils that are expansive or unstable, or that would become unstable as a result of land development or a transportation network improvement. The analysis describes the risks associated with locating development projects and transportation network improvements on expansive or unstable geologic units or soils, including on- or offsite landslides, lateral spreading, subsidence, liquefaction, or collapse. The analysis next assesses the ability of specific requirements of existing laws and regulations (as described in the regulatory setting) to minimize these risks. (Impact GEO-1 separately addresses unstable soils or geologic units resulting in on- or offsite landslide, lateral spreading, subsidence, liquefaction or collapse because of earthquakes or seismic events.)

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, the region is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). Approximately 79 percent of the forecasted regional population increase between 2016 and 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent).

Lateral spreading is the movement of sloping ground as a result of liquefaction. Areas become more prone to liquefaction and lateral spreading during a large earthquake event. Conditions favorable for lateral spreading are frequently found along streams and waterfronts or in loosely placed, saturated, sandy fill. Constructed facilities of most types are vulnerable to heavy damage by lateral spreading, including being pulled apart, buckled, or suffering severe structural damage. In addition, liquefaction can also cause slumping of embankments or tilting of retaining walls that may be associated with regional growth and land use changes. Forecasted regional growth and land use change may be located on soils that are prone to lateral spreading and liquefaction.

Subsidence occurs when excessive groundwater pumping causes the consolidation of soils, which can then be unstable or cause ground failure. As regional growth and land use changes occur, a growing population between 2016 and 2025 would demand additional water supply. Additional housing units would draw additional groundwater and as a result could cause land subsidence.

Much of the population growth projected between 2016 and 2025 would occur in or adjacent to areas with existing development. Although these areas may already have been tested for slope failure, even developed areas, particularly those on or near mountains, hills, or the coast, can experience slope failure. New development in areas prone to slope failure would be at a higher risk, particularly development located in coastal communities. Redevelopment of existing areas or new development would likely require grading or earthwork, which may increase the propensity for soils to become unstable and cause slope failure.

Development may occur in areas containing expansive soils, thereby increasing the risk to people and structures from deterioration of infrastructure, structures, and pavements. If the moisture content and/or soil type differs at various locations under the foundation of a structure, localized or nonuniform movement may occur. This movement can cause damage to the foundation and building structural system, evidenced by cracking of the slab or foundation, cracking in the exterior or interior wall coverings (indicating movement of support framing), uneven floors, and/or misaligned doors and windows. Damage caused by expansive soils can be slow and long term, and not attributable to any particular event. Development that occurs near the coast would be more susceptible to damage caused by expansive soils. Any structure developed in the western part of the San Diego region may also be at risk for expansive soils.

Through adherence to existing laws and regulations, development associated with the proposed Plan would be required to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce geologic hazards, including those associated with lateral spreading, subsidence, unstable soils, slope failure, and expansive soils as described in Section 4.7.2.

Although slope failure may not be completely avoidable, site-specific analyses would reduce risks associated with regional growth development. Corrective measures such as structural reinforcement and using engineered fill to replace unstable and expansive soils would be applied to the design of individual future projects. All site designs would be reviewed and approved by the appropriate agencies.

The incorporated cities and County government within the region have, in their general plans, safety elements required for protections against the risks associated with expansive soils, landslides, subsidence, liquefaction, and other seismic and geologic hazards. Project-specific geotechnical investigations consistent with existing regulatory requirements would identify areas of damage and recommend geotechnical measures to ensure long-term stability, ensuring that regional growth and land use changes on geologic units or soils that are expansive or unstable would not become unstable as a result of the project, or result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse. Adherence to these laws, regulations, local plans, design standards, and practices would ensure impacts would be less than significant. Therefore, this impact is less than significant.

Transportation Network Improvements and Programs

Major transportation network improvements between 2016 and 2025 include new Managed Lanes on I-5 from Manchester Avenue to Vandegrift; new toll lanes on SR 11 to the Otay Mesa POE; Interchange and Arterial Operational improvements at SR 94 and SR 125, and the Otay Mesa POE CVEG; and tolling equipment and Regional Border Management System investments on SR 11. Other major network improvements include double-tracking at certain locations on the LOSSAN rail corridor along with a station addition in the Gaslamp Quarter, San Diego.

Some of these improvements may involve significant grading or earthwork, which increases the likelihood of encountering unstable geologic units and increases the propensity for slope failure. Additionally, some of the transportation improvements would be located in, on, or near hills, coastal areas, canyons, and other places with steep slopes or unstable soils. Specific transportation facilities that would be susceptible to hazards associated with slope failure, or their development are more likely to cause slope failure.

Transportation network improvements in place between 2016 and 2025 that are located in the coastal areas of the region would be subject to lateral spreading and liquefaction, which can cause the slumping of embankments or tilting of retaining walls associated with transportation network improvements. Additionally, liquefaction can cause the failure of highway and railroad embankments built over liquefiable soils. Transportation network improvements in areas prone to lateral spreading and liquefaction would be at risk of damage to pavement, misalignment of railroad tracks, or the failure of bridge piers or abutments.

Improvements could be in areas with soils that have high erosion potential, which may result in greater risk for effects of slope failure, or cause soils to become unstable and cause greater risks to people or structures in proximity to these improvements.

Improvements to the transportation network implemented between 2016 and 2025 may be located in areas with expansive soils, particularly if they are located near the coast. The wetting and drying of soils from water application during construction, landscape irrigation, or from water pipe leaks and storm events can cause significant movement in expansive soils. Transportation network improvements constructed on or adjacent to expansive soils may suffer infrastructure damage, such as weakening or cracking or bridges, concrete platforms, and other facilities.

As discussed previously, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 would require each improvement or project to be reviewed by appropriate regulatory agencies prior to construction and would require each improvement or project to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce impacts from geologic hazards, including unstable and expansive soils and slope failure. Adherence to Hazard Mitigation Plans, grading and erosion regulations, and seismic standards including geologic investigations required by the Alquist Priolo Earthquake Fault Zoning Act would reduce geologic hazards. Project-specific geotechnical investigations consistent with existing regulatory requirements would identify areas of damage and recommend geotechnical measures to ensure long-term stability, ensuring that transportation network improvements on geologic units or soils that are expansive or unstable would not become unstable as a result of the project, or result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse. Therefore, this impact is less than significant.

2025 Conclusion

Between 2016 and 2025, implementation of the proposed Plan would result in land use changes and the construction of transportation network improvements that would expose a greater number of structures to risks from unstable and expansive soils, including landslides, lateral spreading, subsidence, liquefaction, or collapse, or cause soils to become unstable. Adherence to the laws, regulations, and programs included in Section 4.7.2 and project-specific investigations following State and local standards and practices would minimize risks to people or property and ensure impacts from these hazards would be less than significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, the region is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent).

As discussed in the 2025 analysis, additional growth and development would result in an increase of the number of structures and facilities that may be in areas with unstable soils, areas prone to slope failure, and areas with expansive soils. Impacts would be greater between 2026 and 2035 as more development or redevelopment activities would occur in coastal communities or near areas with canyons and hills. As mentioned above, slope failure may not be completely avoidable, but site-specific analyses would minimize risks associated with regional growth development.

All projects associated with regional growth would be required to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce geologic hazards, including those associated with unstable soils, slope failure, and expansive soils. Regulatory agencies with oversight on development associated with the proposed Plan have developed regulations and engineering design specifications to consider and compensate for site-level geological hazards from unstable soils, slope failure, and expansive soils. Corrective measures such as structural reinforcement and using engineered fill to replace unstable and expansive soils would be applied to the design of individual future projects. All site designs would be reviewed and approved by the appropriate agencies. Additionally, Hazard Mitigation Plans, grading and erosion regulations, and seismic standards including geologic investigations required by the Alquist Priolo Earthquake Fault Zoning Act would reduce geologic hazards. Project-specific geotechnical investigations consistent with existing regulatory requirements that identify areas of damage and recommend geotechnical measures to ensure long-term stability would ensure that regional growth and land use changes on geologic units or soils that are expansive or unstable would not become unstable as a result of the project, or result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse. This impact is less than significant.

Transportation Network Improvements and Programs

The transportation network improvements that would be implemented between 2026 and 2035 include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, and SR 125, and on I-5, I-8, I-15, and I-805. Double-tracking of the LOSSAN rail corridor will continue between 2026 and 2035. During

this period, two intermodal transit center Mobility Hub projects will be constructed: the CMH in downtown San Diego and the SYMH at the U.S.-Mexico border.

Similar to the 2025 analysis, transportation network improvements would occur in areas susceptible to slope failure, unstable soils, and expansive soils—particularly improvements located in hilly or coastal areas, such as the managed lanes along the freeways listed above. Specific transportation facilities located in areas prone to slope failure, or where the development of these facilities would be likely to cause slope failure, include services through coastal areas or canyons. These improvements may be at a greater risk for effects of slope failure or cause greater risks to people or structures in proximity to these improvements.

As with regional growth and land use changes, the transportation network improvements in place between 2026 and 2035 that are located in the coastal areas of the region would be subject to lateral spreading and liquefaction, which can cause the slumping of embankments or tilting of retaining walls associated with transportation network improvements. Additionally, liquefaction can cause the failure of highway and railroad embankments built over liquefiable soils. Transportation network improvements in areas prone to lateral spreading and liquefaction would be at risk of damage to pavement, misalignment of railroad tracks, or the failure of bridge piers or abutments. Construction activities associated with transportation network improvements, such as grading and modifying hill slopes, can cause unstable soils. Additionally, the wetting and drying of soils from construction, landscape irrigation, leaking water pipes, and storm events can cause expansion in soils.

As discussed above, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 would require each improvement or project to be reviewed by appropriate regulatory agencies prior to construction and would require each project or improvement to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce impacts from geologic hazards from unstable slopes, slope failure, and expansive soils. Project-specific geotechnical investigations consistent with existing regulatory requirements would identify areas of damage and recommend geotechnical measures to ensure long-term stability, ensuring that transportation network improvements on geologic units or soils that are expansive or unstable would not become unstable as a result of the project, or result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse. This impact is less than significant.

2035 Conclusion

Between 2016 and 2035, implementation of the proposed Plan would result in land use changes and the construction of transportation network improvements that would expose a greater number of structures to risks from unstable and expansive soils, landslides, lateral spreading, subsidence, liquefaction, that collapse, or cause soils to subside or become unstable. However, adherence to the laws, regulations, and programs included in Section 4.7.2 and implementation of project-specific investigations in accordance with local and State standards and practices would minimize risks to people or property and ensure impacts would be less than significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, the region is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent). Approximately 78 percent of the forecasted regional population

increase between 2036 and 2050 is in the City of San Diego (37 percent), San Marcos (13 percent), and City of Chula Vista (28 percent).

As discussed in the 2025 and 2035 analyses above, additional growth and development would result in an increase of the number of structures and facilities that may be in areas with unstable soils or prone to slope failure and areas with expansive soils. Impacts would be greater between 2036 and 2050 as more development or redevelopment activities would occur in coastal communities or near areas with canyons and hills. As mentioned above, slope failure may not be completely avoidable, but site-specific analyses would minimize risks associated with regional growth development. Also, additional housing units would draw groundwater and could result in land subsidence.

All projects associated with regional growth would be required to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce geologic hazards, including those associated with unstable soils, slope failure, and expansive soils. Regulatory agencies with oversight on development associated with the proposed Plan have developed regulations and engineering design specifications to consider and compensate for site-level geological and seismic conditions.

Corrective measures such as structural reinforcement and using engineered fill to replace unstable and expansive soils would be applied to the design of individual future projects. The incorporated cities and County government within the region have, in their general plans, safety elements required for protections against the risks associated with landslides, subsidence, liquefaction, and other seismic and geologic hazards. Adherence to Hazard Mitigation Plans, grading and erosion regulations, and seismic standards including geologic investigations required by the Alquist Priolo Earthquake Fault Zoning Act would reduce geologic hazards. All site designs would be reviewed and approved by the appropriate agencies.

Project-specific geotechnical investigations consistent with existing regulatory requirements would identify areas of damage and recommend geotechnical measures to ensure long-term stability, ensuring that regional growth and land use changes on geologic units or soils that are expansive or unstable would not become unstable as a result of the project, or result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse. Adherence to these laws and regulations and project-specific investigations would ensure impacts would be less than significant.

Transportation Network Improvements and Programs

Major transportation network improvements between 2036 and 2050 include new Managed Lanes and Managed Lane Connectors on SR 52, SR 56, SR 54, SR 125, and SR 905 and on I-5, I-8, I-15, and I-805. Double-tracking at certain locations on the LOSSAN rail corridor would continue during this period. Three major new commuter rail lines will be constructed, including routes between Downtown San Diego and El Cajon (Route 581), National City to the U.S. Border (Route 582 [Extension]), and the CMH to the U.S. Border (Route 583). Improvements also include double-tracking of the SPRINTER, Green Line, and Orange Line. Double-tracking and grade separations on the Blue Line also are included.

Similar to the 2025 and 2035 analyses, transportation network improvements would occur in areas susceptible to slope failure and unstable soils, particularly improvements located in hilly or coastal areas, such as double-tracking of the LOSSAN rail corridor and the new commuter lines. These improvements may be at a greater risk for effects of slope failure or cause greater risks to people or structures in proximity to these improvements. Specific transportation facilities prone to risks of slope failure, or the development of which

would be likely to cause slope failure, include those in downtown San Diego, improvements near the coast, and improvements to highways that would involve grading or tunneling through hills or mountains. In addition, transportation network improvements would be in areas with expansive soils, particularly improvements located near the coast.

As discussed above, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 would require each improvement or project to be reviewed by appropriate regulatory agencies prior to construction and would require each improvement or project to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce impacts from geologic hazards from unstable and expansive soils and slope failure. Project-specific geotechnical investigations consistent with existing regulatory requirements would identify areas of damage and recommend geotechnical measures to ensure long-term stability, ensuring that transportation network improvements on geologic units or soils that are expansive or unstable would not become unstable as a result of the project, or result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse. This impact is less than significant.

2050 Conclusion

Between 2036 and 2050, implementation of the proposed Plan would result in regional growth development and transportation network improvements that would be constructed on expansive soils or expose a greater number of structures to risks from unstable soils, including landslides, lateral spreading, subsidence, liquefaction, or collapse, or cause soils to become unstable. Adherence to the laws and regulations and programs included in Section 4.7.2 and project-specific investigations consistent with local and State standards and practices would minimize risks to people and property and ensure impacts would be less than significant.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan is not expected to exacerbate the climate change effects on geology and soil resources, for reasons similar to those described for Impact GEO-1.

GEO-3 RESULT IN SUBSTANTIAL SOIL EROSION OR THE LOSS OF TOPSOIL.

ANALYSIS METHODOLOGY

Some projects would require extensive cut and fill grading and could result in manufactured slopes that become unstable over time and increase long-term erosion potential. Unusually high volumes of stormwater runoff can also cause slope failures, particularly in areas where native soils have a moderate to high erosion potential.

In addition to soil erosion from long-term exposure to water, the analysis describes the routine soil erosion and loss of topsoil that may also result from construction activities (movement of soil or changes to drainage). Soil is a dynamic natural body capable of supporting a vegetative cover (University of Michigan 2010). Erosion or loss of topsoil can cause loss of arable land, clogged and polluted waterways, and increased flooding. The rate of erosion is highly dependent on human activity that uncover soil, such as farming, logging, building, overgrazing, off-road vehicles, and fires. Natural rates of soil erosion are lower for soil with a good cover of vegetation than for bare soil (University of Michigan 2010). This analysis discusses erosion and the loss of topsoil qualitatively in regards to regional growth and land use change or transportation network improvements.

The analysis assesses how adherence to State and local regulations and standards for the design and practice of grading, clearing, and filling of land would minimize impacts related to soil erosion and loss of topsoil.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, the region is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). Approximately 79 percent of the forecasted regional population increase by 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent).

Development associated with the proposed Plan would cause erosion due to a greater degree of exposed graded or disturbed surfaces, excavation, or stockpiling that would occur with development. This growth would mainly take place in areas of existing urban development, which may increase the susceptibility of soil erosion or loss of topsoil in erosion-prone areas, such as along the coast. New development may disturb soils in previously undisturbed areas. Increased development may also cause higher amounts of water runoff, which can cause or exacerbate erosion problems and slope failure. In addition, the potential for erosion is most common in beachside areas and coastal communities subject to wave action.

Slope instability or erosion problems in the San Diego region are primarily regulated through the CBC and the grading ordinances of local jurisdictions. The CBC requires special foundation engineering and investigation of soils on proposed development sites located in geologic hazard areas. Reports developed from these investigations must demonstrate either that the hazard presented by the project will be eliminated or that there is no danger for the intended use. To minimize slide danger and erosion, a grading permit must be obtained for all major earth-moving projects. All local jurisdictions (County and cities) have grading ordinances designed in part to ensure that development in earthquake or landslide-prone areas does not threaten human life or property. Many of the country's most slide-prone or erosion-prone areas occur along the coastal bluffs, which are regulated under the California Coastal Act and are within the jurisdiction of the California Coastal Commission (CCC). In addition to protecting unique recreational and natural resources, the CCC requires the inclusion of grading, drainage, and erosion control plans with the submittal of a development application. The local geologic background and potential for geologic impacts are important components of local coastal programs under each coastal jurisdiction.

As discussed in Section 4.7.2, the Construction General Permit regulates construction site stormwater management and requires measures that reduce the effects of erosion. Under the Construction General Permit, permit applicants would be required to prepare a SWPPP, which identifies BMPs that must be implemented to reduce construction effects on receiving water quality based on pollutants. The BMPs are directed at implementing both sediment and erosion control measures and other measures to control chemical contaminants.

Adherence to the CBC, coastal zone regulations, construction general permit requirements, and local grading and erosion control ordinances would reduce the potential for substantial soil erosion or loss of topsoil. This impact is less than significant.

Transportation Network Improvements and Programs

Major transportation network improvements between 2016 and 2025 include new Managed Lanes on I-5 from Manchester Avenue to Vandegrift; new toll lanes on SR 11 to the Otay Mesa POE; Interchange and Arterial Operational improvements at SR 94 and SR 125, and the Otay Mesa POECVEG; and tolling equipment and Regional Border Management System investments on SR 11. Other major network improvements include double-tracking at certain locations on the LOSSAN rail corridor along with a station addition in the Gaslamp Quarter, San Diego.

Portions of the transportation improvements included in the proposed Plan would be constructed on or in proximity to steep slopes and would increase the amount of impervious surfaces and the removal of additional vegetative cover. Some transportation or transit projects would require significant earthwork, including cuts into hillsides that can become unstable over time, increasing long-term erosion potential. Road cuts can expose soils to erosion over the life of the project, creating potential landslide and falling rock hazards. Engineered roadways can be undercut over time by stormwater drainage and wind erosion. Some areas would be more susceptible to erosion than others due to the naturally occurring soils with higher erosion potential. Improvements to the transportation network implemented between 2016 and 2025 may cause or worsen soil erosion or loss of topsoil, particularly if those improvements require significant earthwork, such as below-grade transit line extensions or routes. Vibration from new or expanded highways or transit lines may also cause or exacerbate soil erosion along hillsides in canyons or coastal bluffs.

Each improvement or project would be reviewed by appropriate regulatory agencies prior to construction and would adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce soil erosion or loss of topsoil. Adherence to these regulations would reduce the potential for substantial soil erosion or loss of topsoil. For this reason, this impact is less than significant.

2025 Conclusion

Between 2016 and 2025, implementation of the proposed Plan would result in land use changes and the construction of transportation network improvements, both of which would cause soil erosion or the loss of topsoil. However, adherence to the CBC design and construction standards and compliance with the Construction General Permit and other local ordinances would ensure that this impact is less than significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, the region is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent).

Impacts would occur between 2026 and 2035 where regional growth is forecasted to occur in coastal areas or in areas near or in canyons. As stated in the 2025 analysis, the potential for erosion and loss of topsoil increases with human activity and development or redevelopment. Activities such as grading, excavation, stockpiling, boring, and cut-and-fill grading can increase erosion potential and loss of topsoil. Additionally, as described in

the 2025 analysis, an increase in volume or velocity of stormwater can increase erosion potential and loss of topsoil.

Adherence to the CBC, coastal zone regulations, construction general permit requirements, and local grading and erosion control ordinances would reduce the potential for substantial soil erosion or loss of topsoil. For this reason, this impact is less than significant.

Transportation Network Improvements and Programs

The transportation network improvements that would be implemented between 2026 and 2035 include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, and SR 125, and on I-5, I-8, I-15, and I-805. Double-tracking of the LOSSAN rail corridor will continue between 2026 and 2035. During this period, two intermodal transit center Mobility Hub projects will be constructed: the CMH in downtown San Diego and the SYMH at the U.S.-Mexico border.

Similar to the 2025 analysis, transportation network improvements would cause or worsen soil erosion or loss of topsoil, particularly if those improvements require significant earthwork, such as below-grade transit line extensions or routes. Vibration from new or expanded highways or transit lines may also cause or exacerbate soil erosion along hillsides in canyons or coastal bluffs. Particular projects located in coastal areas and expansion in hilly areas would be susceptible to causing soil erosion impacts.

Each improvement or project would be reviewed by appropriate regulatory agencies prior to construction and would adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce soil erosion or loss of topsoil. Adherence to these regulations, the construction general permit, and other local ordinances would reduce the potential for substantial soil erosion or loss of topsoil. For this reason, this impact is less than significant.

2035 Conclusion

Between 2026 and 2035, implementation of the proposed Plan would result in land use changes and the construction of transportation network improvements, both of which would cause soil erosion or the loss of topsoil. Compliance with regulatory requirements and implementation of required design measures would ensure that regional growth and land use changes as well as transportation network improvements and programs associated with the proposed Plan would not cause substantial soil erosion or the loss of topsoil; therefore, this impact is less than significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, the region is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent). Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), San Marcos (13 percent), and City of Chula Vista (28 percent).

Impacts may be greater between 2036 and 2050 than in earlier periods because additional growth is forecasted to occur in coastal areas or in areas near or in canyons. As stated in the 2025 and 2035 analyses, the potential for erosion and loss of topsoil increases with human activity and development or redevelopment. Activities

such as grading, excavation, stockpiling, boring, and cut-and-fill grading can increase erosion potential and loss of topsoil. Additionally, as described in the 2025 analysis, an increase in volume or velocity of stormwater can increase erosion potential and loss of topsoil.

Adherence to the CBC, coastal zone regulations, construction general permit requirements, and local grading and erosion control ordinances would reduce the potential for substantial soil erosion or loss of topsoil. For this reason, this impact is less than significant.

Transportation Network Improvements and Programs

Major transportation network improvements include new Managed Lanes and Managed Lane Connectors on SR 52, SR 56, SR 54, SR 125, and SR 905 and on I-5, I-8, I-15, and I-805. Double-tracking at certain locations on the LOSSAN rail corridor would continue during this period. Three major new commuter rail lines will be constructed, including routes between Downtown San Diego and El Cajon (Route 581), National City to the U.S. Border (Route 582 [Extension]), and CMH to the U.S. Border (Route 583). Improvements also include double-tracking of the SPRINTER, Green Line, and Orange Line. Double-tracking and grade separations on the Blue Line also are included.

Similar to the 2025 and 2035 analyses, transportation network improvements would cause or worsen soil erosion or loss of topsoil, particularly if those improvements require significant earthwork, such as below-grade transit line extensions or routes. Vibration from new or expanded highways or transit lines may also cause or exacerbate soil erosion along hillsides in canyons or coastal bluffs. The greatest impacts from construction would likely occur by 2035, although impacts from operation of transportation improvements would be greatest by 2050, as all projects would be implemented by that time.

Each improvement or project would be reviewed by appropriate regulatory agencies prior to construction and would adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce soil erosion or loss of topsoil. Adherence to these regulations would reduce the potential for substantial soil erosion or loss of topsoil. For this reason, this impact is less than significant.

2050 Conclusion

Between 2036 and 2050, implementation of the proposed Plan would result in land use changes and the construction of transportation network improvements, both of which would cause soil erosion or the loss of topsoil. Compliance with regulatory requirements and implementation of required design measures would ensure that regional growth and land use changes as well as transportation network improvements and programs associated with the proposed Plan would not cause substantial soil erosion or the loss of topsoil; therefore, this impact is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change impacts in the San Diego region that could cause soil erosion or the loss of topsoil, as described in Section 4.7.1, implementation of the proposed Plan, because of compliance with regulatory requirements, would not exacerbate climate change effects regarding increasing erosion and topsoil loss.

GEO-4 HAVE SOILS INCAPABLE OF ADEQUATELY SUPPORTING THE USE OF SEPTIC TANKS OR ALTERNATIVE WASTEWATER DISPOSAL SYSTEMS WHERE SEWERS ARE NOT AVAILABLE FOR THE DISPOSAL OF WASTEWATER, POTENTIALLY CAUSING ADVERSE GROUNDWATER IMPACTS.

ANALYSIS METHODOLOGY

The analysis identifies the general locations of forecasted regional growth and land use change under the proposed Plan that would occur in areas without sewer systems and that thus rely on OWTS. It includes a discussion of the relevant regulations, including County policies for permitting septic systems, and their ability to minimize impacts on groundwater quality.

Transportation network improvements and programs would not affect septic systems or OWTS, as facilities associated with transportation network improvements and programs would not use septic systems; therefore, they are not addressed further in the impact analysis.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, the region is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). Approximately 79 percent of the forecasted regional population increase between 2016 and 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent).

Regional growth and land use change associated with implementation of the proposed Plan would occur in areas containing expansive soils, or soils incapable of supporting the use of septic tanks or OWTS, thereby causing adverse groundwater impacts. If the moisture content and/or soil type differs at various locations supporting a septic tank or alternative wastewater disposal system, localized or nonuniform movement may occur. This movement can cause damage to the septic tank or alternative wastewater disposal system. Damage caused by expansive soils can be slow and long term, and not attributable to any particular event. The issue of expansive soils, or soils incapable of adequately supporting septic tanks or OWTS, is not as common in the San Diego region as in other parts of the country; however, development that occurs near the coast would be more susceptible to damage caused by expansive soils than eastern areas of the region, where the use of septic systems is more common.

Expansive soils, as described in Section 4.7.1, are not confined to the coastal areas, however. The most common type of septic system found in the San Diego region consists of a septic tank connected to leach lines. Areas with OWTS, rather than sewer connections, include the unincorporated communities of North Mountain, Ramona, Rainbow, San Dieguito, Spring Valley, Sweetwater, Valley Center, Alpine, El Cajon, Bonsall, Fallbrook, Central Mountain, North County Metro, Mountain Empire, Julian, Desert, and Crest/Dehesa. Although not coastal communities, these areas have the potential for expansive soils. The North County Metro area has potential expansive soils mapped in the northern part of the community, while Fallbrook and Spring Valley both have potential expansive soils throughout their boundaries. Valley Center has potential expansive soils throughout the community, and Ramona has a concentration of potential expansive soils in the heart of the community,

surrounding SR 67 (County of San Diego 2011a). Therefore, in certain unincorporated communities with forecasted housing unit and population growth between 2016 and 2025, there would be development on soils incapable of supporting septic tanks or OWTS.

Through adherence to existing laws and regulations, including those adopted by the San Diego RWQCB, regional growth and land use change associated with the proposed Plan would be required to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce adverse groundwater impacts associated with expansive soils, or soils incapable of adequately supporting the use of septic tanks and alternative wastewater disposal systems, as described in Section 4.7.2. Specifically, the CBC requires provisions to classify soils as expansive and measures to address expansive soils. In addition, SWRCB Resolution No. 2012-0032 establishes siting, construction, performance requirements, corrective action requirements, monitoring requirements, and waste discharge requirements, which would ensure that septic tanks or OWTS would not affect groundwater or surface water to a degree that makes it unfit for drinking water or other uses.

Corrective measures would be applied to the design of individual future projects. All site designs would be reviewed and approved by the appropriate agencies and consistent with regulatory requirements would ensure that new septic tanks or alternative wastewater disposal systems associated with regional growth and land use change would not result in adverse groundwater impacts due to incapable soils. This impact is less than significant.

2025 Conclusion

Regional growth and land use change associated with the proposed Plan would occur on expansive or unstable soils incapable of supporting the use of septic tanks or alternative wastewater disposal systems; however, adherence to the laws and regulations included in Section 4.7.2 and described above would minimize the potential for adverse impacts on groundwater. Therefore, this impact is less than significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, the region is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent).

As discussed above, the issue of expansive soils, or soils incapable of adequately supporting septic tanks or OWTS, is not as common in the San Diego region as in other parts of the country; however, development that occurs near the coast would be more susceptible to damage caused by expansive soils than eastern areas of the region, where the use of septic systems is more common. Expansive soils, as described in Section 4.7.1, are not confined to the coastal areas, however. As discussed in the 2025 analysis, areas with OWTS include unincorporated parts of the County. Some of these communities have projected population and housing unit increases and have potential expansive soils and are therefore incapable of supporting septic tanks or OWTS.

Additionally, areas with high groundwater levels can also cause unstable soils and may not be able to support the use of septic tanks or alternative wastewater disposal systems, potentially causing adverse groundwater

impacts. Because high groundwater levels occur mainly in the western part of the region, where reliance on these systems is not common and where land use is not anticipated to change substantially between 2026 and 2035, regional growth and land use change associated with the proposed Plan in this area would not have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater, potentially causing adverse groundwater impacts.

As mentioned above, all projects associated with regional growth and land use change under the proposed Plan would be required to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce adverse groundwater impacts from expansive soils or soils incapable of supporting the use of septic tanks or OWTS. Regulatory agencies with oversight on regional growth and land use change associated with the proposed Plan have developed regulations and engineering design specifications to reduce risks from expansive soils or soils incapable of supporting the use of septic tanks or OWTS. Corrective measures would be applied to the design of individual future projects. All site designs would be reviewed and approved by the appropriate agencies, and consistency with regulatory requirements would ensure that new septic tanks or alternative waste-water disposal systems associated with regional growth and land use change would not result in adverse groundwater impacts due to incapable soils. This impact is less than significant.

2035 Conclusion

Implementation of regional growth and land use change associated with the proposed Plan would occur on expansive or unstable soils incapable of supporting the use of septic tanks or alternative wastewater disposal systems; however, adherence to the laws and regulations included in Section 4.7.2 and described above would minimize the potential for adverse impacts on groundwater. Therefore, this impact is less than significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, the region is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent). Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), San Marcos (13 percent), and City of Chula Vista (28 percent).

The issue of expansive soils, or soils incapable of adequately supporting septic tanks or OWTS, is not as common in the San Diego region as in other parts of the country; however, development that occurs near the coast would be more susceptible to damage caused by expansive soils than eastern areas of the region, where the use of septic systems is more common. Expansive soils, as described in Section 4.7.1, are not confined to the coastal areas, however. Areas with OWTS, rather than sewer connections, include the unincorporated communities of the County described in the 2025 and 2035 analyses. In certain parts of these unincorporated communities with forecasted regional population and housing unit growth between 2036 and 2050, there would be development on soils incapable of supporting septic tanks or OWTS.

Additionally, areas with high groundwater levels can also cause unstable soils and may not be able to support the use of septic tanks or alternative wastewater disposal systems. Because high groundwater levels occur mainly in the western part of the region, where reliance on these systems is not common and where land use is not forecast to change substantially between 2036 and 2050, regional growth and land use change associated

with the proposed Plan in this area would not be likely on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater, potentially causing adverse groundwater impacts.

As mentioned above, all projects associated with regional growth and land use change under the proposed Plan would be required to adhere to design standards described in the CBC and all standard design, grading, and construction practices to avoid or reduce adverse impacts on groundwater from expansive soils or soils incapable of supporting the use of septic tanks or OWTS. Regulatory agencies with oversight on regional growth and land use change associated with the proposed Plan have developed regulations and engineering design specifications to reduce risks from expansive soils. Corrective measures would be applied to the design of individual future projects. All site designs would be reviewed and approved by the appropriate agencies, and consistency with regulatory requirements would ensure that new septic tanks or alternative wastewater disposal systems associated with regional growth and land use change would not result in adverse groundwater impacts due to incapable soils. This impact is less than significant.

2050 Conclusion

Between 2036 and 2050, regional growth and land use change associated with the proposed Plan would occur on expansive or unstable soils incapable of supporting the use of septic tanks or alternative wastewater disposal systems; however, adherence to the laws and regulations included in Section 4.7.2 and described above would minimize the potential for adverse impacts on groundwater. Therefore, this impact is less than significant.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects regarding soils that are unsuitable for septic tank use.

PALEO-1 DIRECTLY OR INDIRECTLY DESTROY A UNIQUE PALEONTOLOGICAL RESOURCE OR SITE OR UNIQUE GEOLOGIC FEATURE.

ANALYSIS METHODOLOGY

This section analyzes the potential for ground-disturbing construction activities associated with the implementation of the proposed Plan to uncover unique paleontological resources and unique geologic features. Paleontological resources (i.e., fossil remains) are known to occur within the coastal plain, the desert, and alluvial deposits and other mountain formations. Construction activities associated with both forecasted regional growth and land use change or planned transportation network improvements (deep excavation, trenching, tunneling, blasting, chiseling rock formations, altered hydrologic flow, vibration, or erosion) in previously undisturbed areas would have the highest likelihood for encountering paleontological resources and unique geologic features. This analysis compares areas identified for regional growth and land use change or transportation network improvements with areas mapped as having paleontological sensitivity and the locations of unique geologic features to assess the potential impacts on these resources.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

As described in Section 4.7.1 and Table 4.7-1, geologic formations with moderate to high paleontological resource potential are present throughout the San Diego region, but particularly within the Coastal Plain Region, which is forecasted to have the highest proportion of regional population and housing unit increases from 2016 to 2025. Approximately 79 percent of the forecasted regional population increase during this period is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent). Those same three jurisdictions accommodate approximately 78 percent of new housing units in the region between 2016 and 2025. Excavation and grading activities associated with new development and redevelopment in areas with moderate to high paleontological resource potential, including the cities of San Diego, Chula Vista, and Escondido and unincorporated communities like Otay and North County Metro, may encounter paleontological resources. Ground-disturbing activities in high or moderate sensitivity fossil-bearing geologic formations such as these have the potential to encounter paleontological resources that may be present below the ground surface.

The majority of unique geologic features described in Table 4.7-2 are located in the eastern portions of the region in areas that are not forecasted to change significantly between 2016 and 2025. Additionally, many of the unique geologic features are located in canyons, riverbanks, or other areas where construction would be infeasible or difficult. The policies and ordinances of local jurisdictions typically restrict construction on steep slopes to preserve hillsides and reduce hazards. Therefore, the majority of identified unique geologic features would not be directly impacted from regional development associated with the proposed Plan land use pattern.

However, some of identified unique geologic features listed in Table 4.7-2 are located in areas that would experience increased regional growth and land use change under the proposed Plan. Communities such as Mission Valley contain unique geologic features and are forecast to increase in population and housing unit densities between 2016 and 2025. These geologic features may experience direct impacts from construction associated with increased development, including impacts caused by changes to hydrology and water runoff. Features sensitive to the effects of erosion, such as valley walls, may be impacted by runoff or vibration from construction activities.

Any future development projects implementing the proposed Plan would be required to adhere to the regulations and policies discussed in Section 4.7.2 or listed in Table 4.7-4. These regulations and policies require protection of paleontological resources, with measures such as paleontological monitoring during grading projects and reducing of erosion and runoff in areas where unique paleontological resources and unique geologic features are located, and in some cases limiting development in those areas. These requirements would help reduce impacts on unique paleontological resources and unique geologic resources through avoidance and implementation of BMPs. However, it cannot be guaranteed that these measures would reduce significant impacts for all future development projects. Therefore, impacts on unique paleontological resources and unique geologic features are considered significant.

Transportation Network Improvements and Programs

Implementation of the proposed Plan would result in transportation network improvements and programs being constructed within geologic formations of moderate to high paleontological resource potential and areas containing unique geologic features during the 2016 to 2025 timeframe, such as improvements to the Otay Mesa POE southbound truck route. Ground disturbance associated with roadway improvements, bridge replacements, new rail tracks, track reconfigurations, grade separations; and construction of facilities such as commuter rail maintenance facilities can directly impact unique paleontological resources in areas with high or moderate paleontological resource sensitivity, and can directly and permanently alter unique geologic features, particularly in canyons, coast lines, and mountain passes. Construction and operation of these transportation network improvements would also produce vibration and contribute to the effects of erosion, which would impact unique paleontological resources and unique geologic features.

Upon implementation of the individual transportation network improvements and programs included as part of the proposed Plan, both unique paleontological resources and unique geologic features would be encountered. As discussed above, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 and Table 4.7-4 would help reduce impacts on unique paleontological resources and unique geologic features, but there is no assurance these measures would reduce significant impacts for all future projects. Therefore, impacts on unique paleontological resources and unique geologic features are considered significant.

2025 Conclusion

Implementation of the proposed Plan would result in regional growth and land use change as well as transportation network improvements and programs that would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Therefore, this impact (PALEO-1) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

As discussed in the 2025 analysis above, geologic formations with moderate to high paleontological resource potential are present throughout the San Diego region, particularly within the Coastal Plain Region, which is forecasted to have the highest proportion of regional population and housing unit increases from 2026 to 2035. Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent). Similarly, these three jurisdictions accommodate approximately 76 percent of new housing units. Excavation and grading activities associated with new development and redevelopment of the areas included in the proposed Plan, including the cities of San Diego, National City, and Chula Vista and unincorporated communities like Lakeside, North County Metro, and Otay, may result in impacts on unique paleontological resources and unique geologic features. Ground-disturbing activities in high or moderate sensitivity fossil-bearing geologic formations such as those listed in Tables 4.7-1 have the potential to damage or destroy unique paleontological resources that may be present below the ground surface. The types of activities that would result in significant impacts on unique paleontological resources and unique geologic features (i.e., excavation and grading) in 2025 would continue to occur into 2035 as development intensities would increase to accommodate the forecasted growth. In addition, with more construction planned to occur within previously unearthed areas, or increase the

likelihood of impacts from erosion or changes to hydrology, there is an increased potential to physically destroy or alter unique paleontological resources and unique geologic features. As discussed in the 2025 analysis, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 and Table 4.7-4 would help reduce impacts on unique paleontological resources and unique geologic features, but there is no guarantee that they would be reduce significant impacts for all future projects. Therefore, impacts on unique paleontological resources and unique geologic features are considered significant.

Transportation Network Improvements and Programs

Ground disturbances associated with the construction of transportation network improvements and programs would occur within geologic formations of moderate to high paleontological resource potential and areas containing unique geologic features during the 2026 to 2035 timeframe, including projects such as the Central Mobility Hub, the San Ysidro Mobility Hub, and the Del Mar Tunnel. It is possible that more unique paleontological resources or unique geologic features would also be destroyed or altered by runoff or erosion. As discussed in the 2025 analysis, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 and Table 4.7-4 would help reduce impacts on unique paleontological resources and unique geologic features, but there is no guarantee that they would reduce significant impacts for all future projects. Therefore, impacts on unique paleontological resources and unique geologic features are considered significant.

2035 Conclusion

Implementation of the proposed Plan would result in regional growth and land use change as well as transportation network improvements and programs that would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Therefore, this impact (PALEO-1) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

As discussed in the 2025 and 2035 analyses above, geologic formations with moderate to high paleontological resource potential are present throughout the San Diego region, particularly within the Coastal Plain Region, which is forecasted to have the highest proportion of regional population and housing unit increases from 2036 to 2050. Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), San Marcos (13 percent), and City of Chula Vista (28 percent). Similarly, these three jurisdictions accommodate approximately 89 percent of new housing units. Excavation and grading activities associated with new development and redevelopment of the areas included in the proposed Plan, including the cities of San Diego, San Marcos, and Chula Vista, may result in impacts on unique paleontological resources and unique geologic features. Ground-disturbing activities in high or moderate sensitivity fossil-bearing geologic formations such as those listed in Tables 4.7-1 have the potential to damage or destroy unique paleontological resources that may be present below the ground surface. The types of activities that would result in significant impacts on unique paleontological resources and unique geologic features (i.e., excavation and grading) in 2025 and 2035 would continue to occur into 2050 as development would continue in order to accommodate the forecasted growth. In addition, with more construction planned within previously unearthed areas, or with an increase in the likelihood of impacts from erosion or changes to hydrology, there is an increased potential to physically destroy or alter unique paleontological resources and unique geologic

features. As discussed in the 2025 and 2035 analyses, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 and Table 4.7-4 would help reduce impacts on unique paleontological resources and unique geologic features, but there is no guarantee that they would reduce significant impacts for all future projects. Therefore, impacts on unique paleontological resources and unique geologic features are considered significant.

Transportation Network Improvements and Programs

The transportation network improvements that would be implemented between 2036 and 2050 include the Complete Corridors (individual and freight vehicles), transit leap (a complete network of high-speed, high-capacity, and high-frequency transit services), mobility hubs, and flexible fleets (shared, on demand transportation services).

Ground disturbances associated with the construction of transportation network improvements and programs would occur within geologic formations of moderate to high paleontological resource potential and areas containing unique geologic features during the 2036 to 2050 timeframe, including projects such as the Sorrento Mesa tunnel and the new commuter rail line between Downtown San Diego and El Cajon (Route 581). It is possible that more unique paleontological resources or unique geologic features would also be destroyed or altered by runoff or erosion. As discussed in the 2025 and 2035 analyses, existing federal, State, and local laws, regulations, and programs included in Section 4.7.2 and Table 4.7-4 would help reduce impacts on unique paleontological resources and unique geologic features, but there is no guarantee that they would reduce significant impacts for all future projects. Therefore, impacts on unique paleontological resources and unique geologic features are considered significant.

2050 Conclusion

Implementation of the proposed Plan would result in regional growth and land use change as well as transportation network improvements and programs that would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Therefore, this impact (PALEO-1) in the year 2050 is significant.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan may result in exacerbation of climate change effects on paleontological resources, as described in Section 4.7.1. The development from regional growth and land use changes as well as transportation network improvements and programs would exacerbate the consequences of likely increased landslides in the region. Landslides increase groundwater percolation, which can negatively impact fossil remains, as described in Section 4.7.1.

MITIGATION MEASURES

PALEO-1 DIRECTLY OR INDIRECTLY DESTROY A UNIQUE PALEONTOLOGICAL RESOURCES OR SITE OR UNIQUE GEOLOGIC FEATURE.

2025, 2035, and 2050

PALEO-1a Identify the Potential for Unique Paleontological Resources or Unique Geologic Features for Development Projects or Transportation Network Improvements. During planning, design, and project-

level CEQA review of transportation network improvements or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, assess the potential for disturbing unique paleontological resources (e.g., fossils and fossiliferous deposits consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils) or affecting unique geological features (i.e., a geologic feature that is the best example of its kind locally or regionally, illustrates a geologic principle, provides a key piece of geologic information, is the "type locality" of a fossil or formation, or has high aesthetic appeal) in the project area. For project sites with a high probability of these resources being present, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, retain a qualified paleontologist to conduct a field survey and recommend subsequent steps to be taken during project construction to reduce or avoid impacts on these resources—as described in mitigation measure PALEO-1b—in a report documenting the field survey, and with as-needed support from a registered geologist for unique geologic features not related to fossil localities or fossiliferous deposits.

PALEO-1b Avoid or Reduce Impacts on Unique Paleontological Resources or Unique Geologic Features for Development Projects or Transportation Network Improvements. If it is determined during planning, design, and project-level CEQA review that transportation network improvements or development projects would be located within an area that likely contains unique paleontological resources or unique geologic features (based on results of the work done in mitigation measure PALEO-1a), SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, avoid or reduce impacts on these resources when feasible. If impacts cannot be avoided, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, retain a qualified paleontologist prior to construction to:

- Prepare a paleontological monitoring and mitigation plan, which will outline where monitoring should occur and procedures for discoveries, consistent with applicable regulations and guidelines. Such regulatory standards include the Antiquities Act of 1906, PRPA, and Public Resources Code requirements; regional and local policies of San Diego County and the cities of Carlsbad, Chula Vista, Coronado, Del Mar, Encinitas, Escondido, La Mesa, Lemon Grove, National City, Oceanside, San Diego, San Marcos, Santee, Solana Beach, and Vista; and guidelines of other transportation project sponsors such as the California Department of Transportation's *Standard Environmental Reference, Environmental Handbook: Volume 1: Guidance for Compliance, Chapter 8: Paleontology* (Caltrans 2014).
- Establish procedures for monitoring and the possible preconstruction salvage of exposed unique resources if fossil-bearing rocks or unique geologic features have the potential to be affected.
- Provide preconstruction coordination with contractors.
- Be on site to observe during grading operations and oversee original cutting in previously undisturbed areas of sensitive geologic formations, temporarily halt or redirect construction activities as appropriate to allow recovery of newly discovered fossil remains, recover scientifically valuable specimens or ensure avoidance of the unique paleontological resource or unique geologic feature, and oversee fossil salvage operations and reporting.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of regional growth and land use change as well as transportation network improvements and programs of the proposed Plan would result in significant impacts on a unique paleontological resource or unique geologic feature in 2025, 2035, and 2050. Implementation of mitigation measures PALEO-1a and PALEO-1b would protect these unique resources through the presence of a certified paleontologist and compliance with existing regulations; however, it cannot be guaranteed that these measures will reduce impacts to a less-than-significant level for all projects. Therefore, this impact (PALEO-1) is significant and unavoidable.

4.8 GREENHOUSE GAS EMISSIONS

This section evaluates potential impacts of the proposed Plan related to greenhouse gas (GHG) emissions.

4.8.1 EXISTING CONDITIONS

GLOBAL CLIMATE CHANGE

The phenomenon known as the greenhouse effect keeps the atmosphere near the Earth's surface warm enough for the successful habitation of humans and other life. Present in the Earth's lower atmosphere, GHGs play a critical role in maintaining the Earth's temperature. Sunlight—including infrared, visible, and ultraviolet radiation—passes through the atmosphere. Some of the sunlight striking the Earth is absorbed and converted to heat, which warms the surface. The surface emits infrared radiation to the atmosphere, where some of it is absorbed by GHGs and re-emitted toward the surface; some of the heat is not trapped by GHGs and escapes into space. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and amplifying the warming of the Earth (IPCC 2013).

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the Industrial Revolution. According to the Intergovernmental Panel on Climate Change (IPCC), human influence has warmed the climate at a rate that is unprecedented in at least the last 2,000 years (IPCC 2021). In addition, the IPCC reported with high confidence that in 2019 carbon dioxide concentrations were higher than at any time in at least 2 million years, and reported with very high confidence that 2019 concentrations of methane and nitrous oxide were higher than at any time in at least 800,000 years (IPCC 2021). Rising atmospheric concentrations of GHGs in excess of natural levels enhance the greenhouse effect, which contributes to global warming of the Earth's lower atmosphere. This warming induces large-scale changes in ocean circulation patterns, precipitation patterns, global ice cover, biological distributions, and other changes to the Earth's system that are collectively referred to as *climate change*. The scale of recent changes across the climate system as a whole and the present state of many aspects of the climate system are unprecedented over many centuries to many thousands of years (IPCC 2021). The IPCC also reports that many changes in the climate system become larger in direct relation to increasing global warming, including increases in the frequency and intensity of hot extremes, marine heatwaves, and heavy precipitation, agricultural and ecological droughts in some regions, and proportion of intense tropical cyclones, as well as reductions in Arctic sea ice, snow cover, and permafrost (IPCC 2021). In addition, low-likelihood outcomes, such as ice sheet collapse, abrupt ocean circulation changes, some compound extreme events, and warming substantially larger than the assessed *very likely* range of future warming cannot be ruled out (IPCC 2021). Climate change impacts in this analysis are evaluated in the relevant resource sections (e.g., climate change effects to water supply are discussed in Section 4.18, *Water Supply*, and climate change's influence on wildfire are discussed in Section 4.19, *Wildfire,* and similarly for other sections) and covered in detail in the *Climate Change Projections, Impacts and Adaptatio*n report in Appendix C.

GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants. Criteria air pollutants and toxic air contaminants occur locally or regionally, and local concentrations respond to locally implemented control measures. However, the long atmospheric lifetimes of GHGs allow them to be transported great distances from the original emissions source. GHGs and global climate change therefore represent cumulative impacts; that is, GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change.

PRINCIPAL GREENHOUSE GASES

As defined in Section 15364.5 of the CEQA Guidelines, GHGs include the following gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorinated carbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic (human-made) sources. The primary GHGs associated with implementation of the proposed Plan are CO_2, CH_4, and N_2O. Minor amounts of HFCs, which are considered high global warming potential (GWP) GHGs, may also be generated by leaking air conditioners and refrigerators. The principal characteristics of these pollutants are discussed in this section.

Methods have been set forth to describe emissions of GHGs in terms of a single gas equivalent to simplify reporting and analysis. The most commonly accepted method to compare GHG emissions is the GWP methodology defined in the Intergovernmental Panel on Climate Change (IPCC) reference documents. IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2 (which has a GWP of 1 by definition).

This EIR calculates CO_2e using the same GWP values that the California Air Resources Board (CARB) uses to prepare the State's annual statewide GHG emissions inventory, including the most recent statewide inventory completed in 2020 (CARB 2020a). CARB uses GWP values from the IPCC Fourth Assessment Report (AR4) as shown in Table 4.8-1 (CARB 2020b). The GWP values are considered over a 100-year timeframe.

Different GWP values are used in the IPCC's more recent Fifth Assessment Report (AR5). To understand how using the AR5 values could affect total regional GHG emissions levels, SANDAG has re-calculated the 2016 baseline GHG emissions level using the AR5 values. The analysis shows that 2016 baseline annual GHG emissions levels are 0.3 percent higher when calculated using AR5 values (25.9 million metric tons [MMT] of CO_2e) instead of AR4 (25.8 $MMTCO_2e$). Future projections of annual GHG emissions levels would be similarly affected, with very slight increases, by use of the AR5 values. These calculations and the AR5 GWP values used are included in Appendix G.

Carbon Dioxide

CO_2 is the most abundant anthropogenic GHG and accounts for more than 75 percent of all GHG emissions caused by humans. Its long atmospheric lifetime ensures that atmospheric concentrations of CO_2 will remain elevated for decades even after mitigation efforts to reduce GHG concentrations are promulgated (U.S. Environmental Protection Agency [EPA] 2016a). The primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon). CO_2 is also removed from the atmosphere by photosynthetic organisms. Atmospheric CO_2 has increased from a pre-industrial concentration of 280 parts per million (ppm) to a global monthly mean of 413 ppm as of November 2020 (IPCC 2013, NOAA 2021a).

Methane

CH_4, the main component of natural gas, is the second most abundant GHG and has a GWP of 25 according to IPCC's AR4 (CARB 2020b). Sources of anthropogenic emissions of CH_4 include natural gas and petroleum systems, livestock cultivation, and waste decomposition in landfills (EPA 2019a). Certain land uses also function as a both a source and sink for CH_4. For example, wetlands are a terrestrial source of CH_4, whereas undisturbed, aerobic soils act as a CH_4 sink (i.e., they remove CH_4 from the atmosphere). Atmospheric CH_4 has

increased from a pre-industrial concentration of 721 parts per billion (ppb) to a global monthly mean of 1,891 ppb as of October 2020 (IPCC 2013, NOAA 2021b).

Nitrous Oxide

N_2O is a powerful GHG with a GWP of 298 based on the AR4 (CARB 2020b). Anthropogenic sources of N_2O include agricultural processes (e.g., fertilizer application), nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions. N_2O also is used in rocket engines, racecars, and as an aerosol spray propellant. Natural processes, such as nitrification and denitrification, can also produce N_2O, which can be released to the atmosphere by diffusion. In the United States more than 70 percent of N_2O emissions are related to agricultural soil management practices, particularly fertilizer application. N_2O concentrations in the atmosphere have increased 18 percent from pre-industrial levels of 270 ppb to a global monthly mean of 333 ppb as of October 2020 (IPCC 2013, NOAA 2021c).

Hydrofluorocarbons

HFCs are human-made chemicals used in commercial, industrial, and consumer products and have high GWPs ranging from 124 (HFC-152a) to 14,800 (HFC-23) (CARB 2020b). HFCs are generally used as substitutes for ozone-depleting substances in automobile air conditioners and refrigerants. They were introduced as alternatives to ozone depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are also used in manufacturing. More than three-quarters of HFC emissions in California come from the use of refrigerants in the commercial, industrial, residential, and transportation sectors (CARB 2019a). Within the transportation sector, HFCs from refrigeration and air conditioning units represented about 3 percent of total on-road emissions in California in 2017 (CARB 2019a).

Perfluorocarbons

PFCs are a group of human-made chemicals composed of carbon and fluorine. PFCs do not harm the stratospheric ozone layer, but they are powerful GHGs (CARB 2020c), with GWPs ranging from 7,390 (PFC-14) to 12,200 (PFC-116). These chemicals (predominantly carbon tetrafluoride and hexafluoroethane) were introduced as alternatives, along with hydrofluorocarbons, to ozone depleting substances. PFCs are emitted as byproducts of industrial processes and are also used in manufacturing.

Sulfur Hexafluoride

SF_6 is a human-made chemical used as an electrical insulating fluid in power distribution equipment, the magnesium industry, semiconductor manufacturing, and as a tracer chemical for the study of oceanic and atmospheric processes. SF_6 is a powerful GHG with a GWP of 22,800 (CARB 2020b). Because SF_6 is a human-made chemical, it did not exist in the atmosphere before the twentieth century.

GREENHOUSE GAS GLOBAL WARMING POTENTIALS

Table 4.8-1 lists AR4 GWP values and atmospheric lifetimes of CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6.

Table 4.8-1
Greenhouse Gas Global Warming Potentials (AR4)

Greenhouse Gas		Lifetime (years)	Global Warming Potential (AR4)
Name	**Formula**		
Carbon Dioxide	CO_2	Varies[2]	1
Methane	CH_4	12	25
Nitrous Oxide	N_2O	121	298
Hydrofluorocarbons	HFCs	1 to 270	124 to 14,800
Perfluorocarbons	PFCs	2,600 to 50,000	7,390 to 12,200
Sulfur Hexafluoride	SF_6	3,200	22,800

Sources: Blasing 2016, CARB 2020a.
[1] Defined as the half-life of the gas.
[2] CO_2 cannot be represented with a single lifetime value because the gas is not destroyed over time, but instead moves among different parts of the ocean–atmosphere–land system. Some amounts of CO_2 are absorbed from the atmosphere relatively quickly (for example, by the ocean), but some will remain in the atmosphere for thousands of years, due in part to the slow process by which carbon is transferred to ocean sediments. However, most lifetime estimates fall in the 100- to 300-year range.

GREENHOUSE GAS INVENTORIES

A GHG inventory is a quantification of all GHG emissions and sinks[1] within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (e.g., for global and national entities) or on a small scale (e.g., for a particular building or person). Although some processes are difficult to evaluate, agencies and practitioners have developed tools to quantify emissions from many common sources.

Table 4.8-2 provides the results of the most recent global, national, statewide, and regional GHG inventories to contextualize regional emissions. Globally, the two highest emitting economic sectors of anthropogenic GHG emissions are electricity and heat production (25 percent) and agriculture, forestry, and other land use (24 percent) (IPCC 2014). At the federal level, transportation is the largest emission source (28 percent), followed by electric power 25 percent (EPA 2021a).

Table 4.8-2
Global, National, State, and San Diego Region Greenhouse Gas Emissions Inventories

GHG Emissions Inventory	Annual Emissions ($MMTCO_2e$)
2010 IPCC Global GHG Emissions Inventory[1]	49,000
2019 EPA National GHG Emissions Inventory[2, 3]	5,769
2018 CARB State GHG Emissions Inventory[2]	425.3
2016 San Diego Region GHG Emissions Inventory[2]	25.8

Sources: IPCC 2014, EPA 2021a, CARB 2020a, Appendix G.
[1] These values are estimated using the IPCC's AR5 GWPs.
[2] These values are estimated using the IPCC's AR4 GWPs.
[3] This total accounts for sequestration of carbon from the land sector.

[1]A GHG sink is a process, activity, or mechanism that removes a GHG from the atmosphere.

Within California, transportation is the largest emission source (41 percent), followed by industrial (24 percent) and electric power sources (in-State generation and imported) (15 percent) (CARB 2019a). Within the transportation sector, the majority of the emissions are from passenger vehicles (71 percent) and heavy duty vehicles (21 percent), with smaller amounts from aviation (3 percent), off-road vehicles (2 percent), ships and commercial boats (2 percent), rail (1 percent), and unspecified sources (1 percent) (CARB 2020a). Table 4.8-3 summarizes the statewide GHG inventory for California emissions by sector and percentage in 2018.

Table 4.8-3
2018 Statewide Greenhouse Gas Emissions by Economic Sector, 2018

Sector	Annual Emissions ($MMTCO_2e$)	Percentage of Annual Emissions
Transportation	174	41%
Industrial	102	24%
Electricity Generation (in state)	38	9%
Agriculture	34	8%
Residential	30	7%
Electricity Generation (imports)	26	6%
Commercial	21	5%
Total	**425**	**100%**

Source: CARB 2020a.

Within the San Diego region, on-road transportation – passenger cars and light-duty vehicles is the largest emission source (40 percent), followed by electricity consumption (20 percent), natural gas consumption (12 percent), industrial uses (8 percent), on-road transportation – heavy-duty trucks and vehicles (7 percent), other fuels (4 percent), off-road vehicles (2 percent), solid waste (2 percent), and other sectors representing 1 percent of total emissions or less (Appendix H). Table 4.8-4 summarizes the 2016 GHG inventory for the San Diego region.

Table 4.8-4
Total Greenhouse Gas Emissions in the San Diego Region, 2016

Source	Annual Emissions ($MMTCO_2e$)	Percentage of Annual Emissions
Passenger Cars and Light Duty Vehicles	10.4~~5~~	40%
Electricity	5.3	20%
Natural Gas	3.1	12%
Industrial	2.1	8%
Heavy-Duty Trucks and Vehicles	1.8	7%
Other Fuels	1.1	4%
Off-Road Transportation	0.62	2%
Solid Waste	0.59	2%
Water	0.24	1%
Aviation	0.21	1%
Rail	0.11	<1%
Wastewater	0.07	<1%

Source	Annual Emissions ($MMTCO_2e$)	Percentage of Annual Emissions
Agriculture	0.05	<1%
Marine Vessels	0.05	<1%
Soil Management	0.05	<1%
Total	**26**	**100%**

Source: Appendix H.

Anticipated Effects from Climate Change

Climate change is driving changes in the environment that may in turn influence levels of GHG emissions and the relative effectiveness of mitigation measures. Absent mitigation, climate change may affect GHG emissions due to sea-level rise submerging coastal lands, more frequent and severe flooding, higher temperatures, and higher incidence of wildfire. The San Diego region is likely to experience sea-level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix C.

GHG emissions are responsible for climate change, but some impacts of climate change can also release more GHGs into the atmosphere, resulting in a positive feedback cycle. A biological example of this would be soil carbon sequestration; the combination of increased temperatures and decreased rainfall will likely result in decreased plant productivity and reproduction. As fewer or less robust plants pull less CO_2 out of the atmosphere, soil erosion and loss will increase and there will be less carbon from dead plants available to become incorporated into the soil reducing soil carbon sequestration (Ren et al, 2020). An increase in wildfire frequency and intensity brought about by climate change can also increase GHG emissions in the region by reducing carbon sequestration. Fires that burn through forests remove trees that serve as carbon reservoirs, and high temperature fires can also result in reduced soil carbon sequestration (Reidmiller et al. 2018, Verma and Jayakumar, 2012).

Hotter temperatures in the San Diego region may incentivize more people to use air conditioning more often; in the next decade, summer energy demand in California could increase by 1 gigawatt. This increase in energy use could release more GHG depending on the electricity-generating portfolio. One potential climate adaptation measure to address reduced water supply is to diversify the region's portfolio of water sources, and the San Diego County Water Authority plans to increase its reliance on seawater desalination 2 percent by the year 2035 (SDCWA 2016). This water treatment process is highly energy-intensive, however; this could increase GHG emissions depending on the electricity-generating portfolio. Higher temperatures from climate change can harm some measures used to reduce GHG emissions. For example, attempts to use more solar energy to help reduce GHG emissions may be challenged by high temperatures, which can render solar panels less efficient (Omubo-Pepple et al. 2009).

4.8.2 REGULATORY SETTING

Refer to Section 4.3, *Air Quality*, and Section 4.6, *Energy*, for air quality- and energy-related laws, regulations, plans, and policies that are relevant to GHG emissions.

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

As of June 2021, there is no overarching federal law specifically related to climate change or the reduction of GHG emissions.

Greenhouse Gas Regulations Under the Clean Air Act

Massachusetts v. Environmental Protection Agency

The U.S. Supreme Court ruled in *Massachusetts v. Environmental Protection Agency*, 127 S. Ct. 1438 (2007), that CO_2 and other GHGs are pollutants under the federal Clean Air Act (CCA), which the U.S. Environmental Protection Agency (EPA) must regulate if it determines those GHGs pose an endangerment to public health or welfare.

Endangerment Finding and Cause or Contribute Finding

On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under CAA Section 202(a) (42 United States Code Section 7521).

- **Endangerment Finding:** The Administrator found that the current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

Mandatory Reporting Rule

The EPA adopted a mandatory GHG reporting rule in September 2009. The rule requires suppliers of fossil fuels or entities that emit industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more of GHG emissions to submit annual reports to the EPA beginning in 2011. Vehicle and engine manufacturers were required to begin reporting GHG emissions starting with model year 2011.

Clean Power Plan

In 2015, the EPA published the Clean Power Plan. The Clean Power Plan sets achievable standards to reduce CO_2 emissions by 32 percent from 2005 levels by 2030. This Plan established final emissions guidelines for states to follow in developing plans to reduce GHG emissions from existing fossil fuel-fired electric generating units. Specifically, the EPA established: (1) CO_2 emission performance rates representing the best system of emission reduction for two subcategories of existing fossil-fuel-fired electric generating units: fossil-fuel-fired electric utility steam generating units and stationary combustion turbines; (2) state-specific CO_2 goals reflecting the CO_2 emission performance rates; and (3) guidelines for the development, submittal, and implementation of state plans that establish emission standards or other measures to implement the CO_2 emission performance rates, which may be accomplished by meeting the state goals. This final rule continued

progress already under way in the U.S. to reduce CO_2 emissions from the utility power sector. On February 9, 2016, the Supreme Court (Order No. 15A773) stayed implementation of the Clean Power Plan pending judicial review. As directed by Executive Order on Energy Independence (Executive Order 13783, March 28, 2017), the EPA officially repealed the Clean Power Plan in June 2019 and issued the final Affordable Clean Energy rule in its place (EPA 2019c).

Affordable Clean Energy Rule

The EPA issued the Affordable Clean Energy (ACE) rule on June 19, 2019, in order to replace the Clean Power Plan. The ACE Rule established emissions guidelines for states to use when developing plans to limit CO_2 at coal-fired power plants. Specifically, the ACE rule aims at improving the heat rate as the best system of emissions reductions for CO_2 at coal-fired power plants, with improvements that can be made at individual facilities. States will have 3 years to submit plans. The EPA estimates that the ACE rules will result in a reduction of CO_2 emissions from the electricity sector by as much as 35 percent below 2005 levels by 2030 (EPA 2019c).

Fuel Economy Standards

The National Highway Traffic Safety Administration (NHTSA) and EPA set the Corporate Average Fuel Economy Standards (CAFE) standards to improve the average fuel economy and reduce GHG emissions generated by cars and light duty trucks. NHTSA and EPA adopted a rule in 2019 for the current fuel efficiency standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule). NHTSA and EPA also issued a regulation revoking California's Clean Air Act waiver, which allows California to set its own emissions standards, asserting that the waiver was preempted by federal law (SAFE Rule Part One, 84 *Federal Register* 51310, September 27, 2019). California, 22 other states, the District of Columbia, and two cities have filed suit against the SAFE Rule Part One (*California et al. v. United States Department of Transportation et al*., 1:19-cv-02826, U.S. District Court for the District of Columbia). The lawsuit requests a "permanent injunction prohibiting Defendants from implementing or relying on the Preemption Regulation," but does not stay its implementation during legal proceedings. Part One of the SAFE Vehicles Rule went into effect on November 26, 2019. However, on April 26, 2021, EPA announced plans to reconsider Part One of the SAFE Rule as directed in Executive Order 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis" (discussed below). At the time of preparing this Draft EIR, EPA is seeking public input on its reconsideration of the action. Public comments to the Notice of Reconsideration ended on June 6, 2021 and EPA held a public hearing on June 22, 2021 (EPA 2021b). Nevertheless, at the time this Draft EIR was prepared, the SAFE Rule Part One is in place and it is unclear whether, to what degree, and when the SAFE Rule Part One may be revoked by EPA. As such, the GHG inventory for the San Diego region summarized in Table 4.8-4 and used as the basis for the analysis contained herein reflects compliance with the SAFE Rule Part One using as it exists in June 2021 using CARB-developed adjusted emissions factors.

SAFE Rule Part Two was finalized on March 31, 2020, and went into effect on June 29, 2020. Part Two of the SAFE Rule sets the CAFE standards to increase in stringency by 1.5 percent per year above Model Year (MYs) 2020 levels for MYs 2021–2026. These standards are lower than the previous CAFE standards which required that MYs 2021–2026 increase in stringency by 5 percent per year. The current federal administration has also stated its intent to revisit the current CAFE standards as well. For further information on CAFE standards refer to Section 4.3.

Executive Order 13990

On January 20, 2021, Executive Order 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis" was signed into effect. With respect to climate change, this executive order includes the following agency directives:

- Required the Secretary of the Interior to place a temporary moratorium on the federal oil and gas leasing program in the Arctic National Wildlife Refuge.
- Established an Interagency Working Group on the Social Cost of Greenhouse Gases tasked with developing and promulgating social costs of carbon, nitrous oxide, and methane for agencies to apply during cost-benefit analysis.
- Revoked the presidential permit for construction and operation of the Keystone XL pipeline.

Heavy-Duty Vehicle Program

EPA and NHTSA also set fuel efficiency and GHG standards for medium- and heavy-duty trucks. In 2011, EPA and NHTSA finalized a joint rule that established a national program to reduce GHG emissions and improve fuel economy for new medium- and heavy-duty engines and vehicles. This rule—called the Phase 1 standards—requires fuel efficiency standards for engines in model years 2014 through 2018. In 2016, EPA and NHTSA adopted the Phase 2 standards, which requires fuel efficiency standards for engines in model years 2018 through 2027 (EPA 2016b).

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

The State of California has adopted various laws addressing various aspects of climate change, GHG mitigation, energy efficiency, and renewable energy. Much of this establishes a broad framework for the State's long-term GHG and energy reduction goals and climate change adaptation program. Governors have also issued several Executive Orders (EOs) related to the State's evolving climate change policy. A summary of key laws, regulations, plans, and policies, relevant to the proposed Plan is provided below, organized by general categories.

Executive Orders

There are four primary EOs related to the State's GHG reduction efforts. In general, EOs provide direction to State government agencies but do not place mandates on regional or local governments or the private sector.

- **EO S-03-05**: Established GHG-reduction targets for 2010 (2000 emission levels), 2020 (1990 emission levels) and 2050 (80 percent below 1990 levels).
- **EO S-30-15**: Established a GHG reduction target for 2030 (40 percent below 1990 levels).
- **EO B-55-18**: Established a new statewide goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." This EO directs CARB to ensure future Climate Change Scoping Plans (discussed below) identify and recommend measures to achieve the carbon neutrality goal.
- **EO N-19-19**: Among other things, this EO required the Department of Finance to create a Climate Investment Framework; and required the State Transportation Agency to align transportation spending with achieving objectives of the Climate Change Scoping Plan, and to reduce vehicle miles traveled (VMT) through strategic discretionary investments. In July 2021, the California State Transportation Agency adopted the Climate Action Plan for Transportation Infrastructure (CAPTI). The CAPTI was prepared in the wake of EO N-19-19 and serves an integrated climate change infrastructure plan (CalSTA 2021).

Legislative GHG Reduction Targets

State law sets forth the following requirements for reducing Statewide levels of GHG emissions by 2020 and 2030.

- **Assembly Bill (AB) 32, Health & Safety Code Section 38500 et seq.** Codified the 2020 reduction target of EO S-03-05 (i.e., reduce Statewide GHG emissions to 1990 levels by 2020). AB 32 required CARB to develop a Scoping Plan that describes California's strategy for achieving the 2020 target and to update it every five years.
- **Senate Bill (SB) 32, Health & Safety Code Section 38566.** Codified the 2030 reduction target of EO B-30-15 (i.e., reduce Statewide GHG emissions to 40 percent below 1990 levels by 2030). Adopted in tandem with SB 32, AB 197 of 2016 (Chapter 250, Statutes of 2016) required CARB, in implementing SB 32's 2030 GHG reduction target, to (1) prioritize emissions reductions to consider the "social costs" of GHG emissions and (2) prioritize "direct emission reductions" at large stationary sources and at mobile sources. In 2017, CARB adopted a Scoping Plan that describes California's strategy for achieving the 2030 reduction target.

State Agency GHG Reduction Plans and Strategies

CARB and other State agencies have adopted several plans and strategies to reduce Statewide GHG emissions as described below.

- **AB 32 Scoping Plan.** Laid out the State's strategy for achieving the 2020 reduction target set forth in AB 32. Adopted in 2008 and updated in 2014, the initial Scoping Plan and First Update recommended measures to reduce emissions from a variety of activities and sources, including on-road transportation, electricity generation, building energy use, and uses of high GWP gases. It also recommended that local governments set goals to reduce their municipal and communitywide emissions to 15 percent below existing (at the time of scoping plan adoption) levels by 2020 to match the State's 2020 reduction target (CARB 2008). The initial Scoping Plan and its First Update were replaced by the 2017 Scoping Plan, which was approved by CARB in 2017.
- **California's 2017 Climate Change Scoping Plan.** Identifies measures for how California can achieve the 2030 target set forth in SB 32, and substantially advance toward the 2050 reduction goal identified in EO-S-3-05. The 2017 Scoping Plan integrates several existing CARB regulations and State strategies, including the Cap-and-Trade Program, Low Carbon Fuel Standard (LCFS), SB 350 goals for renewable electricity procurement and doubling of Statewide energy efficiency savings in electricity and natural gas end uses, Mobile Source Strategy, Sustainable Freight Action Plan, and the Short-Lived Climate Pollutant (SLCP) Strategy. The 2017 Scoping Plan accelerates the State's focus on moving freight with zero and near-zero technologies, investing in renewables, using low-carbon fuels including electricity and hydrogen, reducing emissions of short-lived climate pollutants (e.g., CH_4, black carbon, and fluorinated gases), creating walkable communities with expanded mass transit and other alternatives to traveling by car, continuing the cap-and-trade program, and managing natural lands to become carbon sinks. It also recommends that local governments aim to reduce community-wide GHG emissions levels of 6 metric tons of CO_2e ($MTCO_2e$) per capita by 2030 and 2 $MTCO_2e$ per capita by 2050 (CARB 2017a). Measures included in the approved 2017 Scoping Plan are recommendations unless otherwise adopted by legislation, rulemaking, or other processes. Table 4.8-13 in Section 4.8.4, *Environmental Impacts and Mitigation Measures*, below summarizes the various statewide programs and regulations that will assist the State in achieving the goals of the 2017 Scoping Plan.
- **Mobile Source Strategy.** Developed by CARB to provide an integrated planning perspective and common vision for transforming the mobile sector to achieve air quality and climate change goals. It utilizes

conceptual scenarios to illustrate the emissions reduction potential of different vehicle technology mixes and VMT reductions to inform State policy development (CARB 2016a). The Mobile Source Strategy addresses on-road vehicles including passenger cars and light duty trucks, medium and heavy duty trucks, buses, as well as off-road vehicles and equipment, including locomotives, cargo handling equipment, and construction equipment. It supports multiple planning efforts, including the State Implementation Plans for criteria air pollutants, the Scoping Plan, the Short-Lived Climate Pollutant Reduction Strategy (discussed below), and the Sustainable Freight Action Plan (discussed below). CARB was required to update the Mobile Source Strategy by January 1, 2021, and every five years thereafter. The Draft 2020 Mobile Source Strategy was first published for public review in December 2020 (CARB 2020d). Following public input, a Revised Draft 2020 Mobile Source Strategy was released on April 23, 2021 (CARB 2021). As of July 2021, CARB has not adopted the 2020 Mobile Source Strategy.

- **Sustainable Freight Action Plan.** Establishes clear targets to improve freight efficiency, transition to zero-emission technologies, and increase the competitiveness of California's freight system. The Sustainable Freight Action Plan (SFAP) was developed by several State agencies and is a recommendation document that integrates investments, policies, and programs across several State agencies to help realize a singular vision for California's freight transport system. This SFAP recommends a high-level vision and broad direction to the Governor to consider for State agencies to utilize when developing specific investments, policies, and programs related to the freight transport system that serves California's transportation, environmental, and economic interest. The Scoping Plan incorporates potential actions from the SFAP that provide GHG emissions reduction benefits (CARB 2016b).
- **Short-Lived Climate Pollutant Strategy**. SB 1383 (Chapter 395, Statutes of 2016) requires CARB to develop and implement a Short-Lived Climate Pollutant (SLCP) Strategy with the following reductions in emissions by 2030 compared to 2013 levels: methane by 40 percent, HFCs by 40 percent, and black carbon (non-forest) by 50 percent. The bill also specifies targets for reducing organic waste in landfills. SB 1383 also requires CARB to adopt regulations to be implemented on or after January 1, 2024, specific to the dairy and livestock industry, requiring a 40 percent reduction in methane emissions below 2013 levels by 2030, if certain conditions are met. Lastly, the bill requires CalRecycle to adopt regulations to take effect on or after January 1, 2022, to achieve specified targets for reducing organic waste in landfills.

  Per its directive, CARB adopted the SLCP Strategy in 2017, establishing a path to decrease SLCPs from various sectors of the economy. Strategies span from wastewater and landfill practices and methane recovery to reducing natural gas leaks and consumption. The SLCP strategy also identifies measures that can reduce HFC emissions through incentive programs and limitations on the use of high-GWP refrigerants in new refrigeration and air-conditioning equipment (CARB 2017b).
- **Draft 2030 Natural and Working Lands Implementation Plan.** In a joint, interagency effort, the California Environmental Protection Agency (CalEPA), California Department of Food and Agriculture, California Natural Resources Agency, CARB, and California Strategic Growth Council released the *Draft California 2030 Natural and Working Lands Climate Change Implementation Plan* (Draft Plan) in January 2019 (and updated in April 2019 to include errata). The Draft Plan is specific to the natural and working lands sector, which includes farmland, rangeland, forests, grasslands, wetlands, riparian areas, seagrass, and urban green space. The Draft Plan addresses the carbon flux from this sector, including the ever-dynamic changes in both GHG emissions and carbon sequestration associated with the management of these lands, and includes reduction of GHGs and black carbon from forest fires and fire management. The Draft Plan serves as a multidisciplinary approach to conserve and maintain a resilient natural and working lands sector that will gradually shift the natural and working lands sector from being a net carbon emitter to being a net carbon sink, while also improving air quality, water quality, wildlife habitat, recreation, and providing other benefits.

The Draft Plan sets goals for, at a minimum, increasing the rate of State-funded soil conservation practices fivefold, doubling the rate of State-funded forest management and restoration efforts, tripling the rate of State-funded oak woodland and riparian reforestation, and doubling the rate of State-funded wetland and seagrass restoration. The measures included in the Draft Plan are projected to result in cumulative emissions reductions of -36.6 to -11.7 million metric tons of CO_2e by 2045 (CalEPA et al. 2019).

While local efforts in the San Diego region to improve the carbon sequestration of natural and working lands would result in a net carbon dioxide decrease, the GHG emissions inventory summarized in Table 4.8-4 and used in this analysis does not include the GHG flux associated with carbon stocks in California's natural and working lands consistent with CARB's approach in developing statewide GHG emissions inventories (refer to Appendix H for additional discussion of the methodologies used to prepare the GHG emissions inventory).

Transportation Planning

- **SB 375, Chapter 728, Statutes of 2008.** Provides for a new planning process that integrates regional transportation, land use, GHG reduction, and housing planning. SB 375 requires regional transportation plans (RTPs) to incorporate a sustainable communities strategy (SCS) that demonstrates how the region would achieve regional GHG emission reduction targets for passenger vehicles set by CARB. CARB revised SANDAG's GHG targets in 2018 to 15 percent reduction in emissions per capita by 2020 and 19 percent by 2035 based on a 2005 baseline.

  In November 2018, CARB released the 2018 Progress Report on California's Sustainable Communities and Climate Protection Act to evaluate the performance of the SCSs prepared pursuant to the first set of reduction targets established by SB 375. The 2018 Progress Report, issued pursuant to SB 150 (Chapter 646, Statutes of 2017), found that Metropolitan Planning Organizations (MPOs) are not on track to meet the GHG reductions expected under SB 375 for 2020 due to an overall increase in statewide VMT per capita. The 2018 Progress Report concluded that reductions in the rate of VMT growth will be needed to meet longer-term State GHG reductions targets for 2030 and 2050 (CARB 2018).

  Under SB 375, CARB must agree that SCSs are able to meet GHG reduction targets. For this purpose, in September 2019, CARB published updated SCS Program and Evaluation Guidelines, clarifying the scope of the updated strategy-based SCS evaluation process, which consists of four key components:

  - **Tracking implementation under SB 150.** Report on the progress regions have made towards meeting their SB 375 GHG reduction targets.
  - **Policy Commitments.** Determine whether the planned strategies and commitments, when fully and effectively implemented, would achieve the GHG reduction targets, and whether there are any risks to not achieving those commitments.
  - **Incremental Progress.** Report on whether an MPO's proposed SCS has more or enhanced strategies than the currently adopted SCS.
  - **Equity.** Report on the efforts that MPOs are taking to meet federal and State requirements related to equity.

  The Policy Commitments component is the only component used by CARB as the basis for accepting or rejecting the MPO's SB 375 GHG emission reduction target determination (CARB 2019b).

- **SB 743, Chapter 386, Statutes of 2013.** SB 743 of 2013 required that OPR propose changes to the State CEQA Guidelines to address transportation impacts in transit priority areas and other areas of the state. In response, Section 15064.3 was added to CEQA in December 2018, requiring that transportation impacts no longer consider congestion but instead focus on the impacts of VMT. Agencies have until July 1, 2020 to

implement these changes, but can also choose to implement these changes immediately. In support of these changes, OPR published its *Technical Advisory on Evaluating Transportation Impacts in CEQA,* which recommends that the transportation impact of a project be based on whether the project would generate a level of VMT per capita (or VMT per employee or some equivalent metric) that is 15 percent lower than that of existing development in the region, or that a different threshold is used based on substantial evidence (OPR 2018. OPR's technical advisory explains that this criterion is consistent with Public Resources Code Section 21099, which states that the criteria for determining significance must "promote the reduction in greenhouse gas emissions" (OPR 2018. This metric replaces the use of automobile delay metrics such as level of service to measure transportation-related impacts.

Fuel Economy Standards

- **Advanced Clean Cars Program (Passenger Vehicles).** AB 1493 of 2002 (known as Pavley I, Chapter 200, Statutes of 2002) provided the nation's first GHG standards for automobiles. AB 1493 required CARB to adopt vehicle standards that lowered GHG emissions from new light-duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards referred to as the Advanced Clean Cars (ACC) Program's Low Emission Vehicle (LEV) III Regulation) was adopted for vehicle model years 2017–2025 in 2012 (13 California Code of Regulations [CCR] Section 1900 et seq.).

  The ACC Program also includes the Zero Emission Vehicle Program and the Clean Fuels Outlet Regulation. The Zero Emission Vehicle Program is designed to achieve California's long-term emission reduction goals by requiring manufacturers to offer for sale specific numbers of zero-emission vehicles (ZEVs), which include battery electric, fuel cell, and plug-in hybrid electric vehicles. The Clean Fuels Outlet regulation is intended to ensure that fuels such as electricity and hydrogen are available to meet the fueling needs of new advanced technology vehicles as they come to market.

  The Final SAFE Vehicle Rule (discussed above) revokes California's authority to set its own GHG emissions standards and establish ZEV mandates in the state, which affects some of the underlying assumptions in CARB's Emission Factor (EMFAC) models. CARB staff has developed guidance and adjustment factors to be applied to EMFAC emissions outputs to adjust for the revised (reduced) ZEV sales in future years and associated increase in emissions.

- **Low Carbon Fuel Standard.** Originally mandated a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 (17 CCR Section 95480 et seq.). In September 2018, to help achieve, SB 32's emission reduction target, the LCFS regulation was amended to increase the statewide goal to a 20 percent reduction in carbon intensity of California's transportation fuels by at least 2030. Note that the majority of the emissions benefits due to the LCFS come from the production cycle (upstream emissions) of the fuel rather than the combustion cycle (tailpipe) (CARB 2020e).

- **Medium and Heavy-Duty Vehicles.** In 2008, CARB approved the Phase 1 Tractor-Trailer Greenhouse Gas Regulation to reduce GHG emissions by requiring the use of aerodynamic tractors and trailers that are also equipped with low rolling resistance tires (13 CCR Section 2020 et seq.). The regulation applies to certain Class 8 tractors manufactured for use in California and is harmonized with the parallel EPA and NHTSA Phase 1 heavy-duty truck standards. CARB amended the Tractor-Trailer Greenhouse Gas Regulation in 2019 (Phase 2 standards) to align with EPA and NHTSA Phase 2 heavy-duty truck standards.

Electric Vehicles

CARB has three different types of ZEV programs: regulatory, incentive, and supporting. As of July 2019, CARB has 28 ZEV programs either in place or under development (CARB 2019c). Key programs are described below.

- **Executive orders**
    - **EO B-16-12 and EO B-48-18.** On March 23, 2012, Governor Brown issued EO B-16-2012 to encourage the use of ZEVs and related infrastructure. The EO orders CARB, the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and other relevant agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks concerning ZEVs. By 2020, the State's ZEV infrastructure should support up to one million vehicles. By 2025, EO B-16-2012 aims to put over 1.5 million ZEVs on California roads and displace at least 1.5 billion gallons of petroleum. EO B-48-18 set an expanded target of 5 million ZEVs on the road by 2030, as well as a network of 200 hydrogen fueling stations and 250,000 electric vehicle charging stations, including 10,000 DC fast chargers, installed or constructed by 2025 (CEC 2020a).
    - **EO N-79-20**, signed by Governor Newsom on September 23, 2020, provides even more ambitious goals and requirements. These include 100 percent of in-state sales of passenger cars and trucks being ZEVs by 2035; 100 percent of operating medium- and heavy- duty vehicles being ZEVs by 2045; and 100 percent of drayage trucks and off-road vehicles and equipment being ZEVs by 2035. The order also tasks CEC with providing an updated assessment of the infrastructure needed to support this level of ZEV adoption (CEC 2020a).

      The Governor's Interagency Working Group on Zero-Emission Vehicles (ZEVs) developed the ZEV Action Plan, issued in 2013 and subsequently updated in 2016 and 2018, to identify actions that support the State's ZEV goals. Some actions in the ZEV Action Plan that are particularly relevant to the Clean Transportation Program include ensuring ZEVs are accessible to a broad range of Californians and making ZEV technologies commercially viable in the medium- and heavy-duty and freight sectors. Many recommendations in the ZEV Action Plan have been captured in the Clean Transportation Program since the inception of the program and continue to be program priorities (CEC 2020a).
- **Zero Emission Vehicle Regulation (13 CCR Section 1962 et seq.).** The Zero Emissions Vehicle (ZEV) Regulation is a part of CARB's ACC Program and requires manufactures to sell an increasing number of ZEVs over time. Manufacturers are required to produce a number of ZEVs and plug-in hybrids each year, based on the total number of cars sold in California by the manufacturer. Manufacturers with higher overall sales of all vehicles are required to make more ZEVs. Requirements are in terms of percent credits, ranging from 4.5 percent in 2018 to 22 percent by 2025. Each vehicle receives credits based on its electric driving range. The more range a vehicle has, the more credit it receives. CARB's goal is for a minimum of approximately 1 million ZEVs to be on the road by 2025 based on this regulation. EO B-16-12 calls for 1.5 million ZEVs by 2025 (CARB 2018b). As of June 2021, CARB is preparing an update to the ZEV Regulation to accelerate the deployment of ZEVs to the regulated fleets. The update also includes a provision to recognize non-regulated fleets that comply with the incorporation of ZEVs into their fleets through a CARB-developed website.
- **Zero Emission Trucks.** CARB adopted the Advanced Clean Trucks (ACT) Regulation in June 2020, which aims to accelerate the sales of heavy-duty electric vehicles. It consists of two parts, a manufacturer component and a fleet reporting component. Manufacturers are required to sell an increasing percentage of heavy-duty zero-emission vehicles between 2024 and 2035. By 2035, 40 percent of Class 8 truck purchases will be required to be zero emission. Fleets with 50 or more vehicles will be required to report on their fleet's composition and activities in order to help CARB craft new strategies to hasten the adoption of zero-emission vehicles (CARB 2020f).
- **Innovative Clean Transit.** CARB's innovative Clean Transit (ICT) Regulation (13 CCR Section 2023) requires all public transit agencies to gradually transition to a 100 percent zero-emissions bus fleet and encourage them to provide innovative first and last mile connectivity and improved mobility for transit riders. The ICT Regulation requires that 25 percent of their new bus purchases for large transit agencies

are zero-emission starting in 2023 extending to 100 percent in 2029. By 2026, 25 percent of small transit agencies new bus purchases are zero-emission starting in 2026 extending to also 100 percent in 2029.

Renewable Energy

- **Renewables Portfolio Standard** Earlier legislation established California's Renewables Portfolio Standard (RPS), The program sets continuously escalating renewable electricity procurement requirements for the State's load-serving entities. Generation must be procured from RPS-certified facilities SB 2 (1X) of 2011 obligates all California electricity providers to obtain at least 33 percent of their energy from renewable resources by 2020. The CPUC and CEC are jointly responsible for implementing the program
- **SB 350 (Chapter 547, Statutes of 2015)**. This bill's key provisions are to require the following by 2030: (1) an RPS of 50 percent and (2) a doubling of efficiency for existing buildings.
- **SB 100 (Chapter 312, Statutes of 2018))**. This bill establishes a new RPS target of 50 percent by 2026, increases the RPS target in 2030 from 50 to 60 percent, and establishes a goal of 100 percent zero-carbon energy sources by 2045.

As of 2019, San Diego Gas and Electric's (SDG&E) eligible renewable (i.e., solar, wind, eligible hydroelectric, geothermal, and biomass and biowaste) procurement was approximately 31 percent (CEC 2020b). However, through SDG&E's EcoChoice mix, customers in SDG&E's service area may voluntarily choose to receive their electricity from 100 percent eligible renewable sources.

The cities of Chula Vista, Encinitas, Imperial Beach, La Mesa, and San Diego have formed the San Diego Community Power (SDCP) Community Choice Energy (CCE) Program. Additionally, the cities of Carlsbad, Del Mar, and Solana Beach have formed the Clean Energy Alliance (CEA), another CCE Program. These programs are discussed in greater detail below under the heading, "Local Community Choice Energy Programs."

Building Efficiency

- **California Building Energy Efficiency Standards.** The energy consumption of new residential and nonresidential buildings in California is regulated by the Building Energy Efficiency Standards (California Energy Code). CEC updates the California Energy Code every 3 years with more stringent design requirements for reduced energy consumption, which results in the generation of fewer GHG emissions. The 2016 California Energy Code was replaced by the 2019 standards, effective January 1, 2020. The 2019 California Energy Code requires builders to use more energy-efficient building technologies for compliance with increased restrictions on allowable energy use. Additionally, new residential units are required to include solar panels, sized to offset the estimated electrical requirements of each unit (24 CCR Part 6, Section 150.1[c]14).CEC estimates that the combination of required energy-efficiency features and mandatory solar panels in the 2019 California Energy Code will result in new residential buildings that use 53 percent less energy than those designed to meet the 2016 California Energy Code. CEC also estimates that the 2019 California Energy Code will result in new commercial buildings that use 30 percent less energy than those designed to meet the 2016 standards, primarily through the transition to high-efficacy lighting (CEC 2018). CEC's 2018 Integrated Energy Policy Report (IEPR) identified policy goals for carbonizing buildings to assist the State in meeting its long-term GHG reduction targets (CEC 2019). The development of the 2022 California Energy Code and other future triennial updates would likely allow less on-site natural gas usage consistent with the goals of the 2018 IEPR and SB 100. Based on the Draft 2022 California Energy Code, CEC estimates that the implementation of the proposed standards will reduce anticipated increases in statewide natural gas consumption (CEC 2021). See Section 4.6 for additional information regarding CEC's most recent IEPR.
- **California Green Building Standards Code.** California has adopted the Green Building Standards Code (CALGreen, 24 CCCR Part 11), which identify aggressive energy efficiency standards for new residential and non-residential buildings that are continuously updated every few years. The most recent update was the 2019 Building Energy Efficiency Standards, which were adopted in May 2018 and took effect on January 1, 2020. Future standards are expected to result in zero net energy for newly constructed commercial buildings. CalGreen requirements are complementary with California Energy Code discussed above,

California Cap-and-Trade Program

- **Cap-and-Trade.** CARB adopted the Cap-and-Trade program in October 2011. The program is a market-based system with an overall emissions limit for affected emission sources. Affected sources include in-state electricity generators, hydrogen production, petroleum refining, and other large-scale manufacturers and fuel suppliers and distributors. The original Cap-and-Trade program set a compliance schedule through 2020. AB 398 (Chapter 135, Statutes of 2017) extends the program through 2030 and requires CARB to make refinements, including establishing a price ceiling. Revenue generated from the Cap-and-Trade program is used to fund various programs. AB 398 established post-2020 funding priorities to include (1) Air Toxics and Criteria Pollutants, (2) Low and Zero Carbon Transportation, (3) Sustainable Agricultural Practices, (4) Healthy Forests and Urban Greening, (5) Short-lived Climate Pollutants, (6) Climate Adaptation and Resiliency, and (7) Climate and Clean Energy Research.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

SANDAG

SANDAG's Climate Resilience Program helps to reduce regional GHG emissions in alignment with statewide goals to prepare for the impacts of climate change. Efforts include climate action planning and energy

engineering technical services for local jurisdictions, support for electric vehicle deployment and charging installation, and regional climate action and resilience guidance.

San Diego Forward: The Regional Plan

The 2015 San Diego Forward: The Regional Plan (2015 Regional Plan) (SANDAG 2015) is an update of the Regional Comprehensive Plan (RCP) for the San Diego Region and the 2050 RTP/SCS (2050 RTP/SCS) combined into one document. The 2015 Regional Plan provides a blueprint for San Diego's regional transportation system in order to effectively serve existing and projected workers and residents within the San Diego region. In addition to the RTP, the Regional Plan includes the SCS, in compliance with SB 375. The SCS aims to create sustainable, mixed-use communities conducive to public transit, walking, and biking by focusing future growth in the previously developed, western portion of the region along the major existing transit and transportation corridors. The purpose of the SCS is to help the San Diego region meet the GHG emissions reductions set by CARB. The 2015 Regional Plan has a horizon year of 2050, and projects regional growth and transportation projects over this time period.

2019 Federal Regional Transportation Plan

SANDAG prepared a 2019 Federal Regional Transportation Plan (2019 Federal RTP) that demonstrates compliance with federal requirements for the development of regional transportation plans. The 2019 Federal RTP also retains air quality conformity approval from the U.S. Department of Transportation and preserves funding for the San Diego region's transportation investments (SANDAG 2019a).

ReCAP

The SANDAG Board of Directors (Board) accepted the Regional Climate Action Planning Framework (ReCAP) in 2018 (SANDAG 2018a). ReCAP identifies best practices and guidance for preparing Climate Action Plans (CAPs) and monitoring implementation over time. ReCAP establishes a technical framework for regionally-consistent climate action planning that preserves local policy flexibility for the unique needs and circumstances of each local jurisdiction.

Electric Vehicle Readiness Planning and Plug-in San Diego

SANDAG has provided a forum for local governments and other regional stakeholders to address barriers to deploying alternative fuel vehicles and siting charging and fueling stations. In 2014, SANDAG completed a regional readiness plan for plug-in electric vehicles and charging stations titled the San Diego Regional Plug-in Electric Vehicle Readiness Plan (SANDAG 2014). The plan is part of a statewide effort funded through the CEC to prepare local governments for the deployment of EVs. San Diego's Readiness Plan identifies barriers to the deployment of electric vehicle (EV) charging infrastructure and includes recommendations and resources for public agencies, property owners, consumers, and other stakeholders to overcome those barriers. This effort was expanded to planning for all alternative fuels, with a regional alternative fuel plan completed in 2016.

With additional funding from the CEC, SANDAG transitioned from readiness planning to implementation via the Plug-in SD initiative. The initiative is a combination of resource development, training, technical assistance, and outreach. The primary audience of the project includes member agencies, employers, and multi-family properties. The project is also developing a needs assessment to help document existing infrastructure and identify gaps, including access, in the current EV charging network. One of the novel aspects of the initiative is the availability of a technical expert (the "EV Expert") who is made available in person, via phone, and email to assist stakeholders. The San Diego Regional Plug-In Electric Vehicle Readiness Plan also identifies the Electric

Vehicle Infrastructure Training Program (EVITP) as a training resource for local electrical contractors looking to support EVSE installations, provides an overview of previous EVITP trainings, and outlines how contractors can incorporate EVITP certification in a response to Requests for Proposals to deploy charging infrastructure (SANDAG 2019b).

SANDAG Board of Directors Resolution No. 2021-17

Among other things, SANDAG Board of Directors Resolution No. 2021-17 (adopted April 9, 2021) directed its staff to consider the following when drafting the proposed Plan:

- Consistency with local Climate Action Plans.
- At least a 30 percent per capita GHG emissions reduction from the entire on-road transportation sector by 2035.

Although no baseline for the 30 percent per capita reduction was specifically included in Resolution 2021-17, the EIR analysis uses a 2016 baseline for internal consistency.

General Plans

Several of SANDAG's member agencies have general plan elements and policies that specifically address energy use and conservation, VMT reduction, alternative fuels, and modes of transportation, as well as the reduction of GHG emissions and strategies to prepare for the effects of climate change. Such general plans contain goals, objectives, and policies aimed at reducing energy consumption and GHG emissions. These include policies on topics such as energy retrofits to existing residential and commercial buildings, zoning and building ordinances to increase energy efficiency in new construction, and ways to reduce VMT through land use and transportation planning.

Local Plans to Reduce GHG Emissions

Most of SANDAG's member jurisdictions have adopted CAPs, GHG reduction plans, and/or sustainability plans that set goals and targets for the reduction of GHG emissions, and outline policies and/or measures to achieve those goals and targets. Table 4.8-5 summarizes the status of local plans to reduce GHG emissions in the San Diego region (as of June 2021).

Table 4.8-5
Summary of Local Plans to Reduce GHG Emissions (as of November~~June~~ 2021)

Jurisdiction	Document Title	Adopted (year)	New Plan or Update In Progress?	CEQA Qualified Plan?[1]
Carlsbad	Climate Action Plan	2020	No	Yes
Chula Vista	Climate Action Plan	2017	No	No
Coronado	Climate Action Plan	n/a	Yes[2]	n/a
Del Mar	Climate Action Plan	2016	No	No
El Cajon	El Cajon Sustainability Initiative: Policies to Reduce Greenhouse Gas Emissions	2020	No	No
Encinitas	Climate Action Plan	2020	No	Yes

Jurisdiction	Document Title	Adopted (year)	New Plan or Update In Progress?	CEQA Qualified Plan?[1]
Escondido	Climate Action Plan	2021	No	Yes
Imperial Beach	Resilient Imperial Beach: Climate Action Plan	2019	No	No
La Mesa	Climate Action Plan	2018	No	Yes
Lemon Grove	Climate Action Plan	2020	No	No
National City	Climate Action Plan	2011	No	Yes
Oceanside	Climate Action Plan	2019	No	No
Poway	None	n/a	No	n/a
San Diego (City)	Climate Action Plan	2015	Yes	Yes
San Diego (County)	Climate Action Plan	n/a	Yes	n/a
San Diego (Port)	Climate Action Plan	2013	No	Yes
San Diego County Regional Airport Authority	Sustainability Management Program	2020	No	No
San Marcos	Climate Action Plan	2020	No	Yes
Santee	Sustainable Santee Plan	2019	No	Yes
Solana Beach	Climate Action Plan	2017	No	No
Vista	Climate Action Plan	2012	Yes[2]	Yes

Sources: City of Carlsbad 2020, City of Chula Vista 2017, City of Coronado 2021, City of Del Mar 2016, City of El Cajon 2020, City of Encinitas 2020, City of Escondido 2021, City of Imperial Beach 2019, City of La Mesa 2018, City of Lemon Grove 2020, National City 2011, City of Oceanside 2019, City of Poway 2009, City of San Diego 2015, Port of San Diego 2013, San Diego County Regional Airport Authority 2020, City of San Marcos 2020, City of Santee 2019, City of Solana Beach 2017, and City of Vista 2021.

[1] CEQA Qualified Plan = a plan for the reduction of GHG emissions that includes the elements listed in CEQA Guidelines Section 15183.5(b)(1) (as determined by the agency adopting the plan).

[2] The City of Coronado authorized the release of a public draft Climate Action Plan (CAP) on September 7, 2021.

~~3~~[2]The City of Vista published a public draft of a CAP update in 2021 that has not been adopted as of August 6, 2021.

Local Community Choice Energy Programs

The cities of Chula Vista, Encinitas, Imperial Beach, La Mesa, and San Diego formed the SDCP CCE Program, which started delivering power to municipal customers in March 2021. In June 2021 SDCP started providing service to commercial customers, and service to residential customers is anticipated to begin in early 2022. Once fully launched, SDCP will provide electricity service to approximately 770,000 customer accounts. SDCP plans to deliver 55 percent GHG-free electricity in 2021 and supply 100 percent renewable electricity by 2030 or 2035 (SDCP 2021, CalCCA 2021).

Additionally, the cities of Carlsbad, Del Mar, and Solana Beach have formed the CEA, another CCE Program, started delivering power to customers in May 2021. SDCP and CEA work in partnership with San Diego Gas & Electric to deliver GHG-efficient electricity to customers within its member jurisdictions.

4.8.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. The significance criteria specifically developed for this EIR are based on the Appendix G checklist questions and CEQA Guidelines Section 15064.4. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, the unique nature of the proposed Plan's GHG impacts, and the unique characteristics of the proposed Plan.

Checklist questions for GHGs are provided in Section VIII of Appendix G. To better focus the potential impacts associated with the proposed Plan, the Appendix G questions have been combined and modified. Both checklist questions for GHGs have been modified and expanded upon to better focus the potential impacts of Plan implementation against varying regulations and across various benchmark years. For purposes of this EIR, the implementation of the proposed Plan would have a significant GHG impact if it would:

GHG-1	Directly or indirectly result in an increase in GHG emissions compared to existing conditions (2016).
GHG-2	Conflict with the SANDAG region's achievement of SB 375 GHG emissions reduction targets for 2035.
GHG-3	Conflict with or impede achievement of an at least 30% reduction in per capita GHG emissions from the entire on-road transportation sector by 2035 compared to existing conditions (2016).
GHG-4	Conflict with or impede the implementation of local plans adopted for the purpose of reducing GHG emissions.
GHG-5	Be inconsistent with the State's ability to achieve the 2030 reduction target of SB 32 and long-term reduction goals of Executive Orders S-3-05 and B-55-18.

4.8.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

GHG-1 DIRECTLY OR INDIRECTLY RESULT IN AN INCREASE IN GHG EMISSIONS COMPARED TO EXISTING CONDITIONS (2016)

ANALYSIS METHODOLOGY

This analysis is based on the *2016 GHG Inventory and Projections for the San Diego Region* report prepared by SANDAG (Appendix H). This report provides an estimate of 2016 GHG emissions for the San Diego region and GHG projections for the years 2025, 2030, 2035, 2045, and 2050. This analysis compares regional GHG emissions projections for 2025, 2035, and 2050 to 2016 baseline regional GHG emissions to determine if implementation of the proposed Plan would directly or indirectly result in an increase in GHG emissions compared to existing conditions (2016).

The 2016 GHG inventory and projections report includes 15 emissions categories calculated based on the *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions* (ICLEI 2019) and CARB statewide GHG inventory methodology. The projections take into account the forecast regional growth and land use change and planned transportation network improvements and programs of the proposed Plan, and the effect of existing federal and State regulations and regional policies to reduce GHG emissions. The report includes a summary of the methodologies and data used to calculate baseline emissions and emissions projections for each of the 15 emissions categories. For each emissions category the report also describes how

the methods used vary from those used in the previous 2012 GHG inventory prepared as part of the 2015 Regional Plan.

The 2016 inventory and projections report takes into account existing laws, regulations, programs, and policies in effect as of May 2021 to project future GHG emissions out to 2050. The report does not attempt to predict the types of legal, regulatory, policy, economic, technological, and social changes that governments, the private sector, and individuals might make to reduce GHG emissions by 2050. This is because there is substantial uncertainty in projecting future emissions especially for 2050; in general, the level of uncertainty regarding future emissions increases as the projections get closer to 2050. The 2016 inventory and projections report does not and cannot account for several factors that are unknown at this time but will affect future GHG emissions in the San Diego region: future changes in local, State, and federal laws, regulations, and public policy; local, State, national, and global economic conditions; multinational or global agreements; investments and decision-making by private sector actors, including local, national, and global businesses; and personal and group behavior. The following analysis is therefore considered conservative and may overstate actual GHG emission trends in future years.

The 2016 inventory and projections report provides two emissions estimates for the on-road transportation – passenger cars and light-duty vehicles sector: one that reflects implementation of Parts One and Two of the SAFE Rule (discussed in greater detail in Section 4.8.2, *Regulatory Setting*), and another that projects emissions assuming Parts One and Two of the SAFE Rule are not implemented. The analysis included in this EIR reflects implementation of SAFE Rule Parts One and Two. GHG emissions from the two on-road transportation sectors included in this analysis – passenger cars and light-duty vehicles and heavy duty-trucks and vehicles – were calculated using CARB's EMFAC2017 model, which was the most recent version available when EIR preparation commenced following publication of the NOP in November 2016.

For the purpose of evaluating impacts under Impact GHG-1, regional growth and land use change and the transportation network improvements and programs of the proposed Plan are evaluated together because total annual regional GHG emissions are influenced by the combined effects of these two Plan components (among other factors).

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

From 2016 to 2025, the region is forecast to increase by 161,338 people, 97,661 housing units, and 115,328 jobs. Under implementation of the proposed Plan, total GHG emissions in the San Diego region are projected to be approximately 22.4 $MMTCO_2e$ in 2025, or about 13 percent less than total GHG emissions in 2016 (Table 4.8-6).

Table 4.8-6
Total Greenhouse Gas Emissions in the San Diego Region, 2016 to 2025

GHG Emissions Category	2016 (Annual MMTCO2e)[1]	2025 (Annual MMTCO2e)[1]
On-Road Transportation– Passenger Cars and Light-Duty Vehicles [2]	10.45	8.0
Electricity	5.3	3.4
Natural Gas	3.1	3.3
Industrial	2.1	2.2
On-Road Transportation – Heavy-Duty Trucks and Vehicles	1.8	1.7
Other Fuels	1.1	1.4
Off-Road Transportation	0.6	0.7
Solid Waste	0.6	0.6
Water	0.2	0.3
Aviation	0.2	0.3
Rail	0.1	0.2
Agriculture	0.1	0.1
Wastewater	0.1	0.1
Soil Management	0.05	0.04
Total Annual Emission ($MMTCO_2e$)	**25.8**	**22.4**
Change from 2016 to 2025	**- 3.4 $MMTCO_2e$ (13%)**	

Source: Appendix H.
[1] Emissions are estimated using global warming potential values from the Intergovernmental Panel on Climate Change's Fourth Assessment Report.
[2] Emissions estimates for on-road transportation - passenger cars and light-duty vehicles reflect compliance with Rule One of the SAFE Rule, which implements the "One National Program" that sets national fuel economy standards that supersede fuel economy standards independently developed by states, including California. Without implementation of the SAFE Rule, on-road transportation emissions in 2025 would be approximately 7.8 $MMTCO_2e$, 0.2 $MMTCO_2e$ (2.5%) lower than with the SAFE Rule implementation.

While the San Diego region is forecast to experience population, employment, and housing growth by 2025, overall GHG emissions are anticipated to decrease compared to 2016 levels due to the implementation of a series of regulations combined with the land use planning strategies and transportation network improvement programs. For instance, while total VMT in the San Diego region is projected to increase by 2025 (see Table H.5 of Appendix H) as compared to total VMT in 2016, total GHG emissions associated with this VMT in 2025 would be less than in 2016 as vehicles become more fuel efficient to comply with the CAFE standards and electrified as CARB's ACC Program continues to be implemented.

The GHG emissions associated with the electricity and natural gas sectors reflect CEC's latest California Energy Demand 2020–2030 Revised Forecast in the SDG&E service area and account for the improved electricity efficiency and increased renewable energy capacity from photovoltaics (PV) and non-PV electricity generation, behind-the-meter storage,[2] current electricity rate structure, and the appliance and building energy efficiency

[2] Behind-the-meter storage refers to an energy storage system that powers a house or building without passing through an electric meter.

of the California Energy Code up to 2019. Emissions also account for the statutory requirements of SB 100 and the RPS, which require utilities to procure a greater percentage of their electricity supplies from renewable resources by certain benchmark years, including 44 percent of retail sales by 2024.

Notably, as the California Energy Code continues to be updated on a triennial basis, future iterations of the California Code will likely become more energy efficient than the current 2019 code as well as include restrictions on the use of on-site natural gas consumption as the building sector trends towards decarbonization. However, the level of energy efficiency and allowed on-site natural gas associated with future versions of the California Energy Code are unknown at this time because the specific requirements of such future code versions are not known; therefore, emissions from building energy consumption in 2025 may be overestimated.

Additionally, the land use pattern included in the proposed Plan was developed to accommodate regional housing and job growth in locations that will reduce GHG emissions from automobiles and light-duty trucks. The incorporated cities in the San Diego region anticipated to experience the most population, jobs, and housing growth by 2025 include San Diego, Chula Vista, Escondido, and San Marcos. Major transportation network improvements include new Managed Lanes on I-5 from Manchester Avenue to Vandegrift, new toll lanes on SR 11 to the Otay Mesa Port of Entry (POE), Interchange and Arterial Operational improvements at SR 94 and SR 125. Smart Intersection Systems (SIS) technology investments would be made on the following corridors: I-5, I-15, SR 15, I-805, I-8, SR 78, SR 56, SR 52, SR 94, SR 54, SR 163, SR 125, SR 905, and SR 67. Approximately 10 additional regional active transportation projects would be constructed by 2025 in addition to funding support of local bike investments made by the jurisdictions. Transit Leap improvements and programs would include double-tracking at certain locations on the Los Angeles–San Diego–San Luis Obispo (LOSSAN) rail corridor along with a station addition in the Gaslamp Quarter, San Diego, and the inclusion of local bus route frequency enhancements.

These projects would play an important role by decreasing per capita VMT. The decrease in per capita VMT is attributable to a number of factors considered in the transportation modeling contained in the proposed Plan. Investments in transportation-related policies and projects that would directly reduce per capita VMT include funding for transit (e.g., light and commuter rail, bus rapid transit); managed high-occupancy vehicle (HOV), carpool, and high-occupancy toll lanes; and regional bike networks, which would combine to create a more complete transportation network within the San Diego region. Additional policies, such as parking management, microtransit, and deployment of electronic bikes and scooters promote flexibility within the transportation network and would divert potential single-occupancy vehicle trips on a per capita basis. These transportation strategies, among others, combine with demographic (e.g., aging population) and economic (e.g., fuel prices) factors that would result in decreased VMT per capita over the lifespan of the proposed Plan.

The land use pattern and transportation network improvements of the proposed Plan, combined with the implementation of federal and State regulations decreasing GHG emissions from activities in the San Diego region, would result in lower total GHG emissions in 2025 as compared to 2016.

2025 Conclusion

As shown in Table 4.8-6, implementation of the proposed Plan would not directly or indirectly result in an increase in GHG emissions compared to existing conditions because total annual regional emissions would be approximately 13 percent lower in 2025 relative to 2016. Therefore, this impact (GHG-1) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

From 2016 to 2035, the region is forecasted to increase by 310,838 people, 219,311 housing units, and 275,056 jobs. Under implementation of the proposed Plan, total GHG emissions in the San Diego region are projected to be approximately 19.1 $MMTCO_2e$ in 2035, or about 26 percent less than GHG emissions in 2016 (Table 4.8-7).

While the San Diego region is forecast to experience population, employment, and housing growth by 2035, overall GHG emissions are anticipated to decrease compared to 2016 levels due to regulations and programs implemented on the State and regional levels to reduce emissions of GHGs. These programs include implementation of the RPS and SB 100 (60% by 2030), the ACC programs, the Low Carbon Fuel Standard, Cap-and-Trade program, energy efficiency standards for buildings, continued growth in solar photovoltaic installations, water conservation measures, solid waste diversion, refrigerant programs, and emission standards for off-road equipment. The discussion of regulations and programs provided above for 2025 also would apply to emissions in 2035. Also refer to Appendix H for a detailed discussion of how federal and State regulations and programs are accounted for in the regional GHG emissions projections for 2035).

Table 4.8-7
Total Greenhouse Gas Emissions in the San Diego Region, 2016 to 2035

GHG Emissions Category	2016 (Annual $MMTCO_2e$)[1]	2035 (Annual $MMTCO_2e$)[1]
On-Road Transportation– Passenger Car and Light-Duty Vehicles [2]	10.45	6.45
Electricity	5.3	1.3
Natural Gas	3.1	3.4
Industrial	2.1	2.4
On-Road Transportation – Heavy-Duty Trucks and Vehicles	1.8	1.7
Other Fuels	1.1	1.5
Off-Road Transportation	0.6	0.8
Solid Waste	0.6	0.7
Water	0.2	0.2
Aviation	0.2	0.3
Rail	0.1	0.2
Agriculture	0.1	0.1
Wastewater	0.1	0.1
Soil Management	0.05	0.04
Total Annual Emission ($MMTCO_2e$)	**25.8**	**19.1**
Change from 2016 to 2035	**- 6.7 $MMTCO_2e$ (26%)**	

Source: Appendix H.
[1] Emissions are estimated using global warming potential values from the Intergovernmental Panel on Climate Change's Fourth Assessment Report.
[2] Emissions estimates for on-road transportation - passenger cars and light-duty vehicles reflect compliance with Rule One of the SAFE Rule, which implements the "One National Program" that sets national fuel economy standards that supersede fuel economy standards independently developed by states, including California. Without implementation of the SAFE Rule, on-road transportation emissions in 2035 would be approximately 5.9 $MMTCO_2e$, 0.6 $MMTCO_2e$ (9%) lower than with the SAFE Rule implementation.

As described above for 2025, the land use pattern included in the proposed Plan was developed to accommodate regional housing and job growth in locations that would reduce GHG emissions from automobiles and light-duty trucks. The incorporated cities anticipated to experience the most population, jobs, and housing growth between 2026 and 2035 include the cities of San Diego, Chula Vista, Escondido, La Mesa, and National City. Major transportation network improvements include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, SR 125, I-5, I-8, I-15, and I-805. By 2035, there would be five additional improvements to local arterial streets and over 50 additional regional active transportation projects in locations throughout the region. Transit Leap improvements and programs would include continued double tracking at certain locations on the LOSSAN rail corridor, increases in COASTER frequencies, the Del Mar Tunnel, new stations at Central Mobility Hub and at Camp Pendleton, and a grade separation at Leucadia Boulevard. The 2035 phase also includes a major new commuter rail line (Route 582) between National City and Sorrento Mesa in addition to light rail investments with SPRINTER, Blue Line, and Orange Line double tracking and grade separations. An additional Anchor Mobility Hub is assumed at the San Ysidro Transit Center.

These projects would play an important role by decreasing per capita VMT. The decrease in per capita VMT is attributable to a number of factors considered in the transportation modeling contained in the proposed Plan. Investments in transportation-related policies and projects that would directly reduce per capita VMT include funding for transit (e.g., light and commuter rail, bus rapid transit); managed HOV, carpool, and high-occupancy toll lanes; and regional bike networks, which would combine to create a more complete transportation network within the San Diego region. Additional policies, such as parking management, microtransit, and deployment of electronic bikes and scooters promote flexibility within the transportation network and would divert potential single-occupancy vehicle trips on a per capita basis. These transportation strategies, among others, combine with demographic (e.g., aging population) and economic (e.g., fuel prices) factors that would result in decreased VMT per capita over the lifespan of the proposed Plan.

The land use pattern and transportation network improvements and programs of the proposed Plan, combined with the implementation of federal and State regulations decreasing GHG emissions from activities in the San Diego region, would result in lower total GHG emissions in 2035 as compared to 2016.

2035 Conclusion

As shown in Table 4.8-7, implementation of the proposed Plan would not directly or indirectly result in an increase in GHG emissions compared to existing conditions because total annual regional emissions would be approximately 26 percent lower in 2035 relative to 2016. Therefore, this impact (GHG-1) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

From 2016 to 2050, the region is forecasted to increase by 436,563 people, 280,744 housing units, and 439,899 jobs. Under implementation of the proposed Plan, total GHG emissions in the San Diego region are projected to be approximately 18.3~~5~~ $MMTCO_2e$ in 2050, or about 29~~8~~ percent less than GHG emissions in 2016 (Table 4.8-8).

Table 4.8-8
Total Greenhouse Gas Emissions in the San Diego Region, 2016 to 2050

GHG Emissions Category	2016 (Annual $MMTCO_2e$)[1]	2050 (Annual $MMTCO_2e$)[1]
On-Road Transportation – Passenger Car and Light-Duty Vehicles[2]	10.4~~5~~	6.3~~4~~
Electricity	5.3	0.2
Natural Gas	3.1	3.6
Industrial	2.1	2.5
On-Road Transportation – Heavy-Duty Trucks and Vehicles	1.8	1.7
Other Fuels	1.1	1.5
Off-Road Transportation	0.6	1.0
Solid Waste	0.6	0.7
Water	0.2	(0.0)
Aviation	0.2	0.4
Rail	0.1	0.2
Agriculture	0.1	0.1
Wastewater	0.1	0.1
Soil Management	0.05	0.04
Total Annual Emission ($MMTCO_2e$)	**25.8~~26~~**	**18.3**
Change from 2016 to 2050	**-7.5~~8~~ $MMTCO_2e$ (29~~28~~%)**	

Source: Appendix H.
[1] Emissions are estimated using global warming potential values from the Intergovernmental Panel on Climate Change's Fourth Assessment Report.
[2] Emissions estimates for on-road transportation - passenger cars and light-duty vehicles reflect compliance with Rule One of the SAFE Rule, which implements the "One National Program" that sets national fuel economy standards that supersede fuel economy standards independently developed by states, including California. Without implementation of the SAFE Rule, on-road transportation emissions in 2050 would be approximately 5.7 $MMTCO_2e$, 0.7 $MMTCO_2e$ (11%) lower than with the SAFE Rule implementation.

While the San Diego region is forecast to experience population, employment, and housing growth by 2050, overall GHG emissions are anticipated to decrease by 2050 due to the implementation of a series of regulations combined with the land use planning strategies and transportation network improvement programs. These programs include implementation of SB 100 (100 percent of retail electricity sales from eligible renewable energy resources and zero-carbon resources by 2045), the ACC programs, the Low Carbon Fuel Standard, Cap-and-Trade program, energy efficiency standards for buildings, continued growth in solar photovoltaic installations, water conservation measures, solid waste diversion, refrigerant programs, and emission standards for off-road equipment. The discussion of regulations and programs provided above for 2025 and 2035 also would apply to emissions in 2050. Also refer to Appendix H for a detailed discussion of how federal and State regulations and programs are accounted for in the regional GHG emissions projections for 2035.

Additionally, the land use pattern included in the proposed Plan was developed to accommodate regional housing and job growth in locations that would reduce GHG emissions from automobiles and light-duty trucks. The incorporated cities in the San Diego region anticipated to experience the most population, jobs, and housing growth between 2036 and 2050 include the cities of San Diego, Chula Vista, Escondido, La Mesa, National City, and San Marcos.

Major transportation network improvements include new Managed Lanes and Managed Lane Connectors on SR 52, SR 56, SR 54, SR 125, and SR 905, and on I-5, I-8, 1 I-5, and I-805. Rural corridor investments are assumed on SR 76, SR 78, SR 79, SR 94, and I-8. By 2050, there are nearly 60 additional regional active transportation projects planned in locations throughout the region. Transit Leap network improvements and programs would include continued double tracking at certain locations on the LOSSAN rail corridor, increases in COASTER frequencies, Sorrento Mesa and UTC tunnels, and a new station at Balboa Avenue. The 2050 phase also includes three major new commuter rail lines. These include routes between Downtown San Diego and El Cajon (Route 581), National City to the U.S. Border (Route 582 [Extension]), and Central Mobility to the U.S. Border (Route 583). They also include light rail investments with SPRINTER, Green Line, and Orange Line double tracking. Double tracking and grade separations on the Blue Line also are included.

These projects play an important role by decreasing per capita VMT. The decrease in per capita VMT is attributable to a number of factors considered in the transportation modeling contained in the proposed Plan. Investments in transportation-related policies and projects that would directly reduce per capita VMT include funding for transit (e.g., light and commuter rail, bus rapid transit); managed HOV, carpool, and high-occupancy toll lanes; and regional bike networks, which would combine to create a more complete transportation network within the San Diego region. Additional policies, such as parking management, microtransit, and deployment of electronic bikes and scooters promote flexibility within the transportation network and would divert potential single-occupancy vehicle trips on a per capita basis. These transportation strategies, among others, combine with demographic (e.g., aging population) and economic (e.g., fuel prices) factors that would result in decreased VMT per capita over the lifespan of the proposed Plan.

The land use pattern and transportation network improvements of the proposed Plan, combined with the implementation of federal and State regulations decreasing GHG emissions from activities in the San Diego region, would result in lower total GHG emissions in 2050 as compared to 2016.

2050 Conclusion

As shown in Table 4.8-8, implementation of the proposed Plan would not directly or indirectly result in an increase in GHG emissions compared to existing conditions because total annual regional emissions would be approximately 29~~8~~ percent lower in 2050 relative to 2016. Therefore, this impact (GHG-1) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change effects in the San Diego region that could increase GHG emissions as described in Section 4.8.1, *Existing Conditions,* the proposed Plan would reduce GHG emissions and thus would not exacerbate any GHG emissions that occur due to climate change effects.

GHG-2 CONFLICT WITH THE SANDAG REGION'S ACHIEVEMENT OF SB 375 GHG EMISSIONS REDUCTIONS TARGETS FOR 2035

ANALYSIS METHODOLOGY

The analysis evaluates whether the proposed Plan would conflict with SB 375 GHG emission reduction target for 2035. SB 375 requires CARB to develop and update regional GHG emission reduction targets compared to 2005 emissions for passenger vehicles for 2020 and 2035. The updated targets established for SANDAG by CARB in 2018 are to reduce per capita CO_2 emissions 15 percent below 2005 levels by 2020, and to 19 percent below 2005 levels by 2035 (CARB 2018c). CARB has not developed any post-2035 targets (CARB 2018c).

The San Diego region exceeded the 2020 target because by 2020 it had reduced per capita CO_2 emissions from passenger cars and light-duty trucks to 17 percent below 2005 levels. Because the proposed Plan is anticipated to be adopted in 2021, its implementation is unrelated to SANDAG's compliance with the 2020 target, because 2020 is in the past. Therefore, compliance with the 2020 target is not addressed herein. SANDAG's methodology for measuring 2020 target achievement is provided in the Sustainable Communities Strategy documentation prepared for the proposed Plan and has been submitted to CARB for review (Appendix I).

Because SB 375 does not establish 2050 GHG emissions reduction targets, this EIR does not present a 2050 analysis of conflicts with SB 375 emissions reduction targets.

The SB 375-related GHG emissions reductions in 2035 from implementation of the proposed Plan were calculated by SANDAG using the CARB model EMFAC2014 and adjustment factors provided by CARB to account for differences in emissions rates between EMFAC2007 (used to set the 2005 baseline and original targets in 2010) and EMFAC2014. Off-model calculators were used to calculate emission reductions associated with strategies that are not accounted for in SANDAG travel demand modeling tools. Refer to Appendix I for discussion of the CARB methodology that SANDAG is required to use when performing SB 375 calculations, including the reasons for using the EMFAC2014 model.

For the purpose of evaluating impacts under Impact GHG-2, regional growth and land use change and the transportation network improvements and programs of the proposed Plan are evaluated together because the per-capita CO_2 emissions from passenger cars and light-duty trucks addressed by SB 375 targets are influenced by the combined effects of these two Plan components (among other factors).

IMPACT ANALYSIS

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

CARB requires SANDAG to reduce per capita CO_2 emissions from passenger cars and light-duty trucks to 19 percent below 2005 levels by 2035. Table 4.8-9 summarizes the CO_2 per capita reductions from on-model and off-model strategies after accounting for the EMFAC adjustment factor and induced demand adjustment factor. As shown in Table 4.8-9, implementation of the Proposed Plan would reduce per capita CO_2 emissions from passenger cars and light-duty trucks to ~~20.0~~20.4 percent below 2005 levels by 2035. Therefore, implementation of regional growth and land use change and transportation network improvements and programs would not conflict with SB 375 GHG emission reduction targets.

Table 4.8-9
SB 375 GHG Reduction Targets and GHG Emissions under the Proposed Plan from Passenger Vehicles and Light-Duty Trucks, 2035

	Per Capita Reductions from 2005 Levels
Per Capita Reduction under the Proposed Plan (On-Model Results Only)	~~-19.03~~-19.3%
Per Capita Reduction under the Proposed Plan (Off-Model Results Only)	~~-3.05~~-3.03%
CARB Adjustment Factor for EMFAC 2007–2014[1]	+1.7%
Induced Demand Adjustment Factor[2]	~~+0.38~~+0.20%
Per Capita Reductions	-~~20.0~~-20.4%

	Per Capita Reductions from 2005 Levels
CARB Target	-19%

Source: Appendix I.
[1] The GHG reductions for the 2021 Regional Plan were calculated using the CARB model EMFAC 2014 and adjustment factors provided by CARB to account for differences in emissions rates between EMFAC 2007 (used to set the original targets in 2010) and EMFAC 2014.
[2] The induced demand adjustment factor methodology is described in Attachment 3 of Appendix I.

2035 Conclusion

Implementation of the proposed Plan would not conflict with SB 375 emission reduction targets for 2035 because it would result in a 20 percent reduction in per capita CO_2 emissions from passenger cars and light-duty trucks from 2005 levels by 2035, which exceeds the 2035 target of a 19 percent reduction for the SANDAG region. Therefore, this impact (GHG-2) in the year 2035 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change effects in the San Diego region that could increase GHG emissions as described in Section 4.8.1, the proposed Plan would reduce GHG emissions and thus would not exacerbate any GHG emissions that occur due to climate change effects.

GHG-3 CONFLICT WITH OR IMPEDE ACHIEVEMENT OF AN AT LEAST 30% REDUCTION IN PER CAPITA GHG EMISSIONS FROM THE ENTIRE ON-ROAD TRANSPORTATION SECTOR BY 2035 COMPARED TO EXISTING CONDITIONS (2016)

ANALYSIS METHODOLOGY

The analysis evaluates whether the proposed Plan would achieve at least a 30 percent reduction in per capita emissions from the entire on-road transportation sector by 2035 as compared to baseline conditions (2016). This target was included in SANDAG Board of Directors Resolution No. 2021-17, which was adopted April 9, 2021. For purposes of this analysis, the entire on-road transportation sector includes the following sectors from the regional inventory:

- On-road transportation – passenger cars and light-duty trucks, and
- On-road transportation – heavy-duty trucks and vehicles.

To perform this analysis, SANDAG has summed existing GHG emissions in the above sectors for 2016, and divided by the 2016 regional population to determine existing on-road transportation emissions per capita. SANDAG used the same method to determine on-road transportation emissions per capita in 2035. The per-capita metrics for 2016 and 2035 are then compared to determine if the proposed Plan would achieve the at least 30 percent reduction identified in Resolution No. 2021-17.

The GHG emissions used in this analysis were calculated using CARB's EMFAC2017 model, which was the most recent version available when EIR preparation commenced following publication of the NOP in November 2016.

For the purpose of the Impact GHG-3 analysis, regional growth and land use change and the transportation network improvements and programs of the proposed Plan are evaluated together because on-road

transportation sector GHG emissions are influenced by the combined effects of these two Plan components (among other factors).

IMPACT ANALYSIS

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Per capita emissions from the entire on-road transportation sector were 3.7~~1~~4 $MTCO_2$/person/day in 2016. Under implementation of the proposed Plan, GHG emissions from the on-road transportation sector would be reduced to 2.2~~4~~6 $MTCO_2$/person/day in 2035, a 40~~39~~ percent reduction from 2016 levels. The GHG emissions reductions under the proposed Plan would exceed the SANDAG Board Resolution target of a 30 percent reduction by 2035 by 10~~9~~ percent (Table 4.8-10). Therefore, implementation of regional growth and land use change and transportation network improvements and programs would not conflict with or impede achievement of an at least 30 percent reduction in per capita GHG emissions from the entire on-road transportation sector by 2035 compared to existing conditions (2016). This impact would be less than significant.

Table 4.8-10
Calculation to Estimate Per-Capita GHG Emissions from the Entire On-Road Transportation Sector, 2035 compared to 2016

Components Used in the Calculation	2016	2035
Total Emissions from the Entire On-Road Transportation Sector ($MMTCO_2$)	12.2~~3~~	8.1~~2~~[1]
Total Population in the San Diego Region (Residents)	3,287,280	3,620,348
Per Capita Emissions ($MTCO_2$/capita)	3.7~~1~~4	2.2~~4~~6
Percent Reduction under the proposed Plan, 2035 compared to 2016	**-40~~39~~%**	

Source of Total Emissions from the Entire On-Road Transportation Sector: Appendix H.
[1] Emissions estimates for on-road transportation - passenger cars and light-duty vehicles reflect compliance with Rule One of the SAFE Rule, which implements the "One National Program" that sets national fuel economy standards that supersede fuel economy standards independently developed by states, such as California. Without implementation of the SAFE Rule, on-road transportation emissions in 2035 would be approximately 7.5~~6~~ $MMTCO_2e$, 0.6 $MMTCO_2e$ (7%) lower than with the SAFE Rule implementation. The resultant per capita emissions would be 2.07~~9~~ $MTCO_2$/capita.

2035 Conclusion

Implementation of the proposed Plan would reduce 2035 per-capita GHG emissions from the on-road transportation sector by 39 percent compared to 2016 levels, which is higher than the 30 percent reduction identified in SANDAG Board Resolution No. 2021-17. Therefore, this impact (GHG-3) in the year 2035 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change effects in the San Diego region that could increase GHG emissions as described in Section 4.8.1, the proposed Plan would reduce GHG emissions and thus would not exacerbate any GHG emissions that occur due to climate change effects.

GHG-4 CONFLICT WITH OR IMPEDE THE IMPLEMENTATION OF LOCAL PLANS ADOPTED FOR THE PURPOSE OF REDUCING GHG EMISSIONS

ANALYSIS METHODOLOGY

Section 4.8.2, *Regulatory Setting*, describes adopted CAPs, GHG reduction plans, and/or sustainability plans relevant to the proposed Plan. Most of SANDAG's member jurisdictions have adopted CAPs, GHG reduction plans, and/or sustainability plans that set goals and targets for the reduction of GHG emissions, and outline policies and/or measures to achieve those goals and targets. Generally, these local targets are developed in consideration of the State's long-term GHG reduction goals by legislatively significant benchmark years (e.g., 2030).

The proposed Plan is generally evaluated against the goals, measures, and implementing actions of local CAPs and GHG reduction plans to determine any conflicts in this analysis. A detailed CAP consistency analysis by jurisdiction is provided in Appendix J. The analysis of the proposed Plan and local CAPs is provided for 2025, 2035, and 2050. Although no adopted local CAPs or GHG reduction plans have 2050 horizon years, the analysis addresses potential conflicts between the proposed Plan and such adopted plans in 2050 because the effects of these plans would extend beyond their horizon years, including through 2050. Because the local CAPs establish goals, objectives, and policy measures for both regional growth and land use change and transportation network improvements, the analysis of conflicts with local climate action plans does not separate the two categories. The impact assessment addresses both forecast regional growth and land use change and the planned transportation network improvements and programs.

IMPACT ANALYSIS

2025, 2035, and 2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

As of June 2021, 16 of the 19 local jurisdictions in the San Diego region have an adopted CAP or similar plan to reduce GHG emissions. One city and the County do not have an adopted CAP or plan to reduce GHG emissions but are in the process of preparing one; another city does not have an adopted plan and is not in the process of preparing one.

An analysis of whether the proposed Plan would conflict with the policies, measures, and actions of adopted plans is provided in Appendix J. Typically, CAPs include various measures and actions to reduce GHG emissions by sector including, but not limited to, transportation, energy, solid waste, water and wastewater, and carbon sequestration. Common measures to reduce emissions from the transportation sector include the promotion of near-zero and zero-emission vehicles and associated infrastructure, the deployment of TDM strategies such as iCommute and commuter benefits programs, and the development of Complete Streets that include pedestrian and bicycle programs, among others. A major objective of the proposed Plan is to reduce GHG emissions from passenger cars and light-duty trucks. Therefore, many transportation network improvements and programs that would be implemented under the proposed Plan would complement these existing and future local efforts to reduce GHG emissions from the on-road transportation sector.

Other examples of local CAP measures that reduce GHG emissions include renovations to existing buildings to be more energy efficient, deployment of solar PV to existing and new residential and nonresidential buildings, additional waste diversion goals exceeding statewide requirements, capture and control of landfill emissions, improved water efficiency in existing and new residential and nonresidential development, and tree planting to increase carbon sequestration. These implementing actions would be outside of the scope of the proposed Plan and SANDAG's direct authority and therefore, their implementation would not be impeded or obstructed

by implementation of the regional growth and land use changes and transportation network improvements and programs included in the proposed Plan.

2025, 2035, and 2050 Conclusion

Implementation of regional growth and land use change and transportation network improvements and programs under the proposed Plan would not conflict with or impede the implementation of adopted CAPs, GHG reduction plans, and/or sustainability plans. Therefore, this impact (GHG-4) in the years 2025, 2035, and 2050 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change effects in the San Diego region that could increase GHG emissions as described in Section 4.8.1, the proposed Plan would reduce GHG emissions and thus would not exacerbate any GHG emissions that occur due to climate change effects.

GHG-5 BE INCONSISTENT WITH THE STATE'S ABILITY TO ACHIEVE THE 2030 REDUCTION TARGET OF SB 32 AND LONG-TERM REDUCTION GOALS OF EXECUTIVE ORDERS S-3-05 AND B-55-18

ANALYSIS METHODOLOGY

This analysis evaluates whether the proposed Plan would be inconsistent with the State's ability to achieve the SB 32 target of reducing statewide GHG emissions to 40 percent below the 1990 levels by 2030 and whether the proposed Plan is inconsistent with the State's ability to achieve the EO B-55-18 goal of statewide carbon neutrality by 2045 across all sectors. The analysis also evaluates whether the proposed Plan is inconsistent with the State's ability to achieve the EO S-3-05 goal of reducing California's GHG emissions to 80 percent below 1990 levels by 2050.

To perform this analysis, SANDAG identified estimated emissions reduction reference points for the region for 2030, 2045, and 2050, based on the target dates from SB 32 and Executive Orders S-3-05 and B-55-18. The GHG emissions results for 2030, 2045, and 2050 from the 2016 GHG inventory and projections prepared for Appendix H are then compared to the reference points. Note that there is no requirement that the SANDAG region's emissions be reduced by the same percentage ("equal share") as the statewide percentage in order for the State to achieve the goals of SB 32, EO S-3-05, and EO-B-55-18. For purposes of this EIR, the proposed Plan's impacts nevertheless are considered significant if total emissions in the San Diego region exceed the estimated 2030, 2045, and 2050 GHG reduction reference points.

Because there is not an available 1990 emissions inventory for the San Diego region that is comparable to the regional inventory and projections prepared for the proposed Plan, reference points were developed for this analysis to show the level of GHG reductions needed between 2016 (the baseline year of the inventory and

proposed Plan) and future years of 2030, 2045, and 2050 that would be equivalent to level of reductions needed when measured against 1990.[3]

In 2016, total statewide emissions equaled 429 $MMTCO_2e$, which was 2 $MMTCO_2e$ (less than 1 percent) lower than the statewide 1990 emissions level of 431 $MMTCO_2e$ (CARB 2018d). Because total statewide emissions in 2016 were essentially equal to the statewide 1990 level, for purposes of this analysis, total regional emissions in 2016 are assumed to be representative of total regional emissions in 1990. Therefore, to identify the reference point for 2030 a 40 percent reduction was applied to the total regional emissions in 2016, which results in a 2030 reference point of 15.6 $MMTCO_2e$. Similarly, to identify a reference point for 2050, an 80 percent reduction was applied to the total regional emissions in 2016, which results in a 2050 reference point of 5.2 $MMTCO_2e$. The reference point for 2045 is 0 $MMTCO_2e$ because EO-55-18 sets a goal of statewide carbon neutrality no later than that year.[4]

For purposes of evaluating impacts under Impact GHG-5, because the SB 32, EO S-3-05, and EO-B-55-18 targets and regional reference points reflect GHG emissions from the proposed Plan's regional growth and land use change and the planned transportation network improvements and programs, the analysis does not separate the two categories. The impact assessment includes both forecasted regional growth and land use change and planned transportation network improvements and programs.

IMPACT ANALYSIS

2030

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Total regional emissions in 2016 were estimated to be approximately 25.8 $MMTCO_2e$. Under implementation of the proposed Plan, total GHG emissions for the San Diego region would be 20.34 $MMTCO_2e$ in 2030, which is above the 2030 reference point of 15.6 $MMTCO_2e$ (Table 4.8-11). Therefore, total regional emissions in 2030 under implementation of regional growth and land use change and transportation network improvements and programs would be inconsistent with the levels of reductions required by SB 32.

[3] The 2012 inventory report prepared for the 2015 Regional Plan included an estimated 1990 emissions level for the San Diego region, but it was prepared using data sources and methods that do not allow for a direct comparison with the GHG emissions projections provided in the 2016 GHG Inventory and Projections report prepared for the proposed Plan.

[4] As of July 2021, the State has yet to develop or adopt an overarching plan that provides the framework for how California will achieve carbon neutrality by 2045. It is anticipated that achieving this goal would require a combination of GHG emissions reduction and GHG emissions removal strategies; however, it is unknown at this time what combination of reduction and removal strategies will be pursued in California to achieve this goal. Therefore, in this EIR SANDAG uses a net-zero GHG emissions reference point for 2045 for evaluating consistency with EO B-55-18 with the acknowledgement that, between now and 2045, the State is likely to complete a plan for achieving carbon neutrality that includes details addressing which, if any, sectors will have greater than zero emissions, and identifies GHG emissions removal strategies that would offset residual emissions to result in net zero total emissions.

Table 4.8-11
Reference Point and GHG Emissions under the Proposed Plan, 2030

	Annual Emissions ($MMTCO_2e$)
GHG Emissions in the San Diego Region in 2016	25.8
GHG emissions in the San Diego Region in 2030[1,2]	20.34
2030 Reference Point (40% below 2016 levels)	15.6

Source: Appendix H.
[1]Emissions are estimated using global warming potential values from the Intergovernmental Panel on Climate Change's Fourth Assessment Report.
[2] Emissions estimates for passenger vehicles and light-duty trucks reflect compliance with Rule One of the SAFE Rule, which implements the "One National Program" that sets national fuel economy standards that supersede fuel economy standards independently developed by states, such as California. Without implementation of the SAFE Rule, total emissions in the region would be 19.9 $MMTCO_2e$, 0.45 $MMTCO_2e$ (2%) lower than with the SAFE Rule implementation.

As shown in Table 4.8-11, the projected emissions in the San Diego region in 2030 would not meet the 2030 reference point of 15.6 $MMTCO_2e$ following implementation of the proposed Plan. However, as discussed in the 2017 Scoping Plan, GHG emissions reduction will need to be achieved by every GHG emitting sector beyond the land use and transportation sectors to achieve the statewide 2030 target.

Under proposed Plan implementation, total GHG emissions from the on-road transportation would decrease to 7.24 $MMTCO_2e$ by 2030, which is 3.21 $MMTCO_2e$ (310 percent) lower than the 2016 level of 10.45 $MMTCO_2e$ (Appendix H). These reductions are achieved through a combination of the proposed Plan's land use pattern and transportation network improvements and programs that reduce VMT and improve the efficiency of vehicle travel, as well as the federal and State regulations improving vehicle efficiency and increasing use of zero-emission vehicles. Despite these transportation-related reductions under proposed Plan implementation, total regional GHG emissions would exceed the reference point for 2030.

To meet the statewide target of SB 32, California will need to achieve reductions across all GHG-emitting sectors including, but not limited to, the energy, solid waste, wastewater, industrial, agricultural, and high-GWP sectors, among others. The major strategies identified in the 2017 Scoping Plan to reduce GHG emissions from these sources and achieve the statewide 2030 target are summarized in Table 4.8-13.

2030 Conclusion

Because the total emissions in the San Diego region of 20.34 $MMTCO_2e$ in 2030 would exceed the regional 2030 GHG reference point of 15.6 $MMTCO_2e$ (which is based on SB 32 targets for 2030), the proposed Plan's 2030 GHG emissions would be inconsistent with the State's ability to achieve the goals of SB 32. Therefore, this impact (GHG-5) in the year 2030 would be significant.

2045 and 2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Total regional emissions in 2016 were estimated to be 25.8 $MMTCO_2e$. Under implementation of the proposed Plan, total GHG emissions for the San Diego region would be 18.2 $MMTCO_2e$ in 2045 and 18.3 $MMTCO_2e$ in

2050,[5] which is above the 2045 reference point of 0 $MMTCO_2e$ and 2050 reference point of 5.2 $MMTCO_2e$ (Table 4.8-12). Therefore, total regional emissions in 2045 and 2050 under implementation of regional growth and land use change and transportation network improvements and programs would be inconsistent with the levels of reductions required by EO S-3-05 and EO B-55-18.

Table 4.8-12
Reference Points and GHG Emissions under the Proposed Plan, 2045 and 2050

	Annual Emissions ($MMTCO_2e$)
GHG Emissions in the San Diego Region in 2016	25.8
GHG Emissions in the San Diego Region in 2045 with Proposed Plan[1,2,3]	18.2
2045 Reference Point (carbon neutral target in EO B-55-18)	0
GHG Emissions in the San Diego Region in 2050 with Proposed Plan[1,2,3]	18.3
2050 Reference Point (80% below 2016 levels per EO S-3-05)	5.2

Source of GHG Emissions in the San Diego Region: Appendix H.
[1]Emissions are estimated using global warming potential values from the Intergovernmental Panel on Climate Change's Fourth Assessment Report.
[2] Emissions estimates for passenger vehicles and light-duty trucks reflect compliance with Rule One of the SAFE Rule, which implements the "One National Program" that sets national fuel economy standards that supersede fuel economy standards independently developed by states, such as California. Without implementation of the SAFE Rule, total emissions in the region in 2045 would be approximately 17.5 $MMTCO_2e$, 0.75 ~~MMTCO2e~~ (43~~%~~) lower than with the SAFE Rule implementation, and in 2050 would be approximately 17.67 ~~MMTCO2e~~, 0.63 ~~MMTCO2e~~ (32~~%~~) lower than with the SAFE Rule implementation.
[3] Emissions estimates reflect implementation of the land use changes and planned transportation network improvements included in the proposed Plan.

As addressed in Impact GHG-2, the proposed Plan would reduce per capita CO_2 emissions from passenger cars and light-duty trucks to meet the per capita target for 2035 established by SB 375. These reductions are achieved through a combination of land use planning and transportation network improvements and programs that reduce VMT and improve the efficiency of vehicle travel. In addition, the proposed Plan would reduce per capita GHG emissions from the entire on-road transportation sector by 4039 ~~39~~ percent in 2035 relative to 2016 levels, as detailed in Impact GHG-3. The reductions from the entire on-road transportation sector account for the land use and transportation components of the proposed Plan as well as the federal and State regulations improving vehicle efficiency and increasing use of zero-emission vehicles.

[5] Total GHG emissions levels are projected to be generally the same in 2045 and 2050, at 18.2 and 18.3 $MMTCO_2e$, respectively. One reason is because the adopted laws and regulations accounted for in the projections are expected to be in place for the duration of the planning period, but many do not place additional requirements on the regulated entities/activities after 2025 or 2030, so their effect on emissions-generating activities (e.g., driving, building energy use) becomes constant during the later years of the proposed Plan, while the total amount of emissions-generating activities continues to increase through the proposed Plan horizon year of 2050 due to forecasted growth. The downward trend in total GHG emissions from 2016 to 2045 shows that the effectiveness of adopted laws and regulations and the proposed Plan in reducing total GHG emissions outweighs the increase in emissions-generating activities that occurs under the proposed Plan. The flatline in total GHG emissions from 2045 to 2050 shows that the adopted laws and regulations and the proposed Plan would not be able to achieve additional reductions in total GHG emissions because of the forecasted growth and associated increase in emissions-generating activities that would occur during this period.

Despite these transportation-related reductions under proposed Plan implementation, total regional GHG emissions would exceed the reference points for 2045 and 2050. Additional reductions would be needed in the transportation sector and all other GHG sectors to achieve the goals of EO B-55-18 and S-3-05. The other sectors include how energy is sourced, generated, and used; how solid waste is generated, managed, and disposed of; treatment, conveyance, and uses of water supply and wastewater; energy sources and feedstocks for industrial processes and activities; management of natural and working lands; and uses of high-GWP gases. Achieving GHG reductions from these sectors at the scale required to meet the goals of EO B-55-18 and S-3-05 would require major changes to government regulation, private sector activity, consumer behavior, and other facets of life throughout California and beyond.

2045 and 2050 Conclusion

Because total regional GHG emissions in 2045 and 2050 would exceed the 2045 and 2050 reference points of net zero and 5.2 $MMTCO_2e$, respectively (based on the goals of EO B-55-18 and S-3-05), the proposed Plan's 2045 and 2050 GHG emissions would be inconsistent with the State's ability to achieve the goals of EO B-55-18 and S-3-05. Therefore, this impact (GHG-5) in the years 2045 and 2050 would be significant.

Exacerbation of Climate Change Effects

Although there will be climate change effects in the San Diego region that could increase GHG emissions as described in Section 4.8.1, the proposed Plan would reduce GHG emissions and thus would not exacerbate any GHG emissions that occur due to climate change effects.

MITIGATION MEASURES

GHG-5 BE INCONSISTENT WITH THE STATE'S ABILITY TO ACHIEVE THE 2030 REDUCTION TARGET OF SB 32 AND LONG-TERM REDUCTION GOALS OF EXECUTIVE ORDERS S-3-05 AND B-55-18

Basis for Selection of GHG Mitigation Measures

Overview

Many features currently included in the proposed Plan (e.g., the SCS, increased transit, and active transportation investments) have the effect of reducing GHG emissions that might otherwise occur. Mitigation measures presented in this section are additional feasible GHG reduction measures not included in the proposed Plan that SANDAG or other agencies could implement. Presented below are three types of feasible GHG reduction mitigation measures presented later in this section:

- Plan- and policy-level mitigation measures SANDAG has committed to implement.
- Mitigation measures for transportation network improvements and programs, which SANDAG has committed to implement for its projects and which other transportation project sponsors can and should implement for their projects.
- Mitigation measures for development projects implementing regional growth and land use changes, which local jurisdictions can and should implement.

While SANDAG has the authority to implement the mitigation measures it has committed to, it has no legal or jurisdictional authority to require other transportation project sponsors or local jurisdictions to implement

mitigation measures for specific projects for which they have responsibility and jurisdiction. As explained in the introduction to Chapter 4, mitigation can include measures that are within the responsibility and jurisdiction of another public agency. SANDAG in its CEQA findings may find that those measures assigned to other agencies can and should be adopted by those other agencies (CEQA Guidelines Section 15091(a)(2)). Additional Plan-level measures to reduce GHG emissions are included as components of the project alternatives in Chapter 6, rather than as individual mitigation measures in this section. These include still more compact land use patterns and policies to reduce transit fares, increase parking prices, and establish road user fees.

To provide context for the EIR's proposed GHG mitigation measures, it is important to first understand the State's strategies for achieving statewide GHG reductions under SB 32, EO S-3-05, and EO B-55-18. It is also important to understand what GHG reduction measures are included in the proposed Plan, what GHG reductions are being achieved as a result of the 2015 Regional Plan EIR's mitigation measures, and what other SANDAG GHG reduction plans and programs already exist. This information is provided below, following which the proposed Plan EIR GHG measures are presented.

Background

Background: State Strategy and Measures to Achieving the SB 32 Target

The 2017 Scoping Plan establishes the statewide framework for achieving the goal of a 40 percent reduction from 1990 GHG levels in 2030 and put post-2030 statewide emissions on a downward trajectory toward the long-term statewide GHG reduction goals for 2045 and 2050. The Scoping Plan accounts for several major climate statutes and regulations that will be integral to achieving the scale of GHG reductions necessary to achieve the statewide 2030 target and post-2030 goals. The 2017 Scoping Plan indicates that to achieve these targets and goals, long-term investments in renewable energy generation, electrified transportation, energy efficient and decarbonized buildings, enhanced industry efficiency, restoration of California's natural and working lands, and sustainable solid waste management are among many actions the State must take. CARB notes that to reach the State's long-term GHG reduction goals, local, regional, and State agencies must engage with each other and local stakeholders to coordinate climate change solutions and programs to reduce local GHG emissions. The proposed Plan would assist in meeting the statewide 2030 GHG target in putting statewide emissions on a downward trajectory toward statewide post-2030 goals by reducing GHG emissions in the passenger vehicle sector through the implementation of transportation network improvements and programs and efficient land use patterns to ultimately reduce VMT and the combustion of gasoline and diesel fuels pursuant to SB 375.

Table 4.8-13 summarizes the 2017 Scoping Plan strategies to achieve the SB 32statewide 2030 reduction target.

Table 4.8-13
2017 Scoping Plan Strategies to Achieve the Statewide 2030 Target

Scoping Plan Strategy	Strategy Description	Statewide Emissions Reductions by 2030 ($MMTCO_2e$)[1]
Cap-and-Trade	This statute clarifies the role of the Cap-and-Trade Program through 2030. In addition, the statute requires CARB to include a price ceiling, price containment points, specific offset credit usage limits for projects with direct	236 (38% of needed reductions by 2030)

Scoping Plan Strategy	Strategy Description	Statewide Emissions Reductions by 2030 ($MMTCO_2e$)[1]
	environmental benefits within the state, and industry assistance factors for allowance allocation as part of the regulation. Other provisions include developing approaches to increase offset projects with direct environmental benefits in the state while prioritizing disadvantaged communities, Native American or tribal lands, and rural and agricultural regions, with a new Compliance Offsets Protocol Task Force providing guidance to CARB. The statute establishes a new Independent Emissions Market Advisory Committee to report annually on the environmental and economic performance of the Cap-and-Trade Regulation and other climate policies. Two reports are required: one by the California Workforce Development Board on resources needed for education, job training, and workforce development related to meeting GHG reduction goals; the other by the Legislative Analyst's Office on the economic impacts and benefits of the GHG targets.	
Short-Lived Climate Pollutants	The May 2014 First Update to the Climate Change Scoping Plan identified the need for a short-lived climate pollutant reduction strategy (SLCP Strategy) to minimize the impact of these short-term, yet powerful, climate forcers. SB 605 requires CARB to develop a plan to reduce emissions of SLCPs, and SB 1383 requires CARB to approve and begin implementing the plan by January 1, 2018. SB 1383 also sets targets for statewide reductions of SLCPs from 2013 levels by 2030—specifically, a 40 percent reduction of methane and HFCs, and a 50 percent reduction of anthropogenic black carbon. Over three-quarters of HFC emissions in California come from the use of refrigerants in the commercial, industrial, residential, and transportation sectors. The annual Montreal Protocol Meeting of Parties in October 2016 resulted in an international agreement to globally phase down HFC production. Per the SLCP strategy, depending on the level of future HFC reductions expected from this agreement, the State may also: • Consider placing restrictions on the sale or distribution of refrigerants with a potential GWP >2,500; and • Consider prohibiting refrigerants with a GWP >150 in new stationary refrigeration equipment and refrigerants with a GWP >750 for new stationary air-conditioning equipment. The strategy was approved by CARB on March 23, 2017. On October 24, 2017, CARB held a public workshop to discuss a proposal for reducing high-GWP refrigerant emissions from stationary refrigeration and air conditioning equipment using a two-step process: (1)	217 (35% of needed reductions by 2030)

Scoping Plan Strategy	Strategy Description	Statewide Emissions Reductions by 2030 ($MMTCO_2e$)[1]
	begin a rulemaking process to adopt into State regulations the EPA's Significant New Alternatives Policy Rule provisions as they relate to prohibitions on certain HFCs; and (2) further evaluate the proposed HFC mitigation strategies in the SLCP Strategy for potential future rulemakings.	
Mobile Sources Strategy & Freight	The Mobile Source Strategy identifies actions to be undertaken to simultaneously meet air quality standards, achieve GHG emission reduction targets, decrease toxics health risk, and reduce petroleum consumption from transportation emissions by 2031. The California Sustainable Freight Action Plan (Action Plan) is a multi-State agency effort to improve freight system efficiency by 25 percent by 2030, and to deploy over 100,000 freight vehicles and equipment capable of zero-emission operation, and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030. The Action Plan Includes recommendations on: • A long-term 2050 Vision and Guiding Principles for California's future freight transport system. • Targets for 2030 to guide the State toward meeting the Vision. • Opportunities to leverage State freight transport system investments. • Actions to initiate over the next 5 years to make progress towards the Targets and the Vision. • Pilot projects to achieve on-the-ground progress in the near-term. • Additional concepts for further exploration and development, if viable.	64 (10% of needed reductions by 2030)
Energy Efficiency from the Residential, Commercial, Industrial, Agriculture Sectors	Various statutes to improve energy efficiency from the residential, commercial, industrial, and agricultural sectors will combine to reduce statewide GHG emissions by 64 $MMTCO_2e$ by 2030. Additionally, the Title 24 California Building Code will continue to be updated on a triennial basis to become more energy efficiency and trend towards decarbonization.	64 (10% of needed reductions by 2030)
Biofuels (Low Carbon Fuel Standard)	The LCFS requires producers of petroleum-based fuels to reduce the carbon intensity of their products, beginning with a quarter of a percent in 2011 culminating in a 10% total reduction in 2020, and a 20% total reduction by 2030. Petroleum importers, refiners, and wholesalers can either develop their own low carbon fuel products, or buy LCFS Credits from other companies that develop and	25 (4% of needed reductions by 2030)

Scoping Plan Strategy	Strategy Description	Statewide Emissions Reductions by 2030 ($MMTCO_2e$)[1]
	sell low carbon alternative fuels, such as biofuels, electricity, natural gas, or hydrogen.	
Renewables Portfolio Standard	California's RPS Program was established in 2002 (SB 1078) with the initial requirement to generate 20% of their electricity from renewable by 2017, 33% of their electricity from renewables by 2020 (SB X1-2 of 2011), 52% by 2027 (SB 100 of 2018), 60% by 2030 (also SB 100 of 2018), and 100% from carbon-free sources by 2045 (also SB 100 of 2018).	16 (3% of needed reductions by 2030)

Source: CARB 2017a.

[1] Emissions reductions are calculated from a statewide baseline inventory level of 431 $MMTCO_2e$, which comprises the 2020 target as mandated by AB 32. Emissions reflect a cumulative estimate of total emissions that would be reduced by 2030 over a 10-year period (2021 through 2030). Based on modeling performed by CARB, these emissions represent discrete reductions and do not overlap.

Background: State Strategy to Meeting California's Mid-Century Climate Goals

As of June 2021, the State has not adopted a plan analogous to the 2017 Scoping Plan that addresses achieving the EO S-3-05 goal of reducing statewide GHG emissions by 80 percent below 1990 levels by 2050 or the B-55-18 goal of achieving statewide carbon neutrality no later than 2045. Available research and reports indicate that achieving these long-term reduction goals will require major shifts or even fundamental transformations in the economic, social, technological, and political fabric of life in California and beyond including the development of new technologies; large-scale deployment of new and existing technologies; and the roles of local, State, and the federal government in regulating economic activities and personal behaviors that affect GHG emissions.

While no formal plan exists akin to the 2017 Scoping Plan to catalogue the State's framework to meeting the longer-term goals of EO S-3-05 and B-55-18, a 2020 Report prepared by Energy and Environmental Economics (E3) has been prepared to assist CARB in the development of the 2022 Scoping Plan, which will evaluate progress towards the 2030 GHG emissions target and chart a path for deep decarbonization by 2045 to reduce and/or replace fossil fuels (E3 2020). The report found that achieving carbon neutrality by 2045 requires ambitious near-term actions around deployment of building energy efficiency; transportation and building electrification; zero-carbon electricity; and reductions in nonenergy, non-combustion GHG emissions. In addition, achieving carbon neutrality will require scaling up research, development and deployment (RD&D) efforts around carbon dioxide removal strategies, such as land-based carbon sequestration and direct air capture of CO_2.

The E3 Report also found that achieving the zero-carbon energy scenario requires rapid deployment of electrification in vehicles and buildings achieving 100 percent electric or zero-carbon energy sales shares by 2030, if expensive early retirement of equipment is to be minimized. Likewise, very low carbon, if not zero-carbon electricity will be needed by 2045 in order to support these high levels of electrification. This will require rapid adoption of renewable generation and renewable integration solutions, at a pace that exceeds recent historical levels of wind and solar adoption. An interagency research process is underway to evaluate in more detail the electricity sector implementation strategies and implications of achieving the State's SB 100 goal of meeting 100 percent of retail sales electricity with zero-carbon electricity.

The E3 Report states that all carbon neutral scenarios achieve dramatic reductions in fossil fuel combustion and fossil fuel emissions, which will result in global climate change benefits, as well as the potential for improvements in local air quality and associated health impacts. Scenarios with lower fossil fuel combustion will achieve greater improvements in statewide air quality and, likely, local health impacts. However, local health benefits in any specific community will be location and source specific. Although outside the scope of the E3 analysis, properly valuing the local air quality and health benefits associated with reducing fuel combustion is an important consideration in designing California's carbon-neutral future.

Background: Conclusion Regarding State Strategy and Measures

Full implementation of many of the measures identified in the 2017 Scoping Plan that could result in a 40 percent reduction of GHG emissions by 2030 in the San Diego region would require major changes in clean technologies utilization; markets; and local, State, and federal policies and regulations. The precise pathway to meeting the State's mid-century goals (e.g., achieving carbon neutrality no later than 2045; reducing emissions to 80 percent below 1990 levels by 2050) is still unclear, but would require the decarbonization of the State's electrical sector, decarbonization of existing buildings and new construction, electrification of the entire transportation sector, investments in healthy soils, sustainable solid waste and wastewater management, and carbon dioxide removal strategies, such as land-based carbon sequestration and direct air capture of CO_2. The required GHG reductions from the aforementioned sectors can only be achieved through a coordinated effort by, at minimum, State, regional, and local agencies, organizations, and stakeholders, and is well beyond the ability and jurisdiction of SANDAG alone.

Background: Role of SANDAG in Planning for GHG Emissions Reductions

As an MPO and Council of Governments (COG) with a mission of promoting quality of life in the region, SANDAG has engaged in climate planning efforts for over a decade, leveraging the agency's position as a bridge between local and State governments and building upon its statutory requirements under SB 375. The agency has prepared a wide range of climate-related plans and programs. Some have been explicitly connected to climate change, while others are more indirectly related and result in GHG reductions or carbon emissions removal that is incidental to their primary purpose (e.g., the Smart Growth Incentive Program supports land development and infrastructure improvements that also contribute to lower VMT and associated GHG emissions; the Environmental Mitigation Program conserves and restores native habitats to compensate for the loss of habitat resulting from transportation capital projects, which can retain carbon stored in soils and vegetation on the region's natural lands and contribute to removal of emissions from the atmosphere).

This following describes SANDAG's many activities for achieving GHG emissions reductions, including the proposed Plan strategies to reduce GHG emissions as required by SB 375, the GHG mitigation measures previously adopted by SANDAG as part of its 2015 Regional Plan, and other plans and programs that SANDAG proactively prepares and implements that are not required by State or federal law or regulation.

Background: Proposed Plan Strategies and Actions to Reduce GHG Emissions

SANDAG has direct responsibility for planning for achieving passenger vehicle GHG reduction targets through the development and implementation of an SCS pursuant to SB 375. The proposed Plan includes an SCS and demonstrates that, if the proposed Plan is implemented, the San Diego region would achieve its SB 375 target for 2035. Analysis performed by SANDAG and included in the SCS documentation for the proposed Plan demonstrates that the San Diego region has achieved its SB 375 target for 2020 (Appendix H).

The proposed Plan includes many strategies that contribute to GHG reductions under SB 375 and identifies implementation actions that SANDAG will take to realize these reductions. The strategies can be broadly categorized as transportation system infrastructure and operations, demand management, land use, and zero-emission vehicles.

The proposed Plan incorporates several transportation system infrastructure and operation strategies, including investments in:

- Managed Lanes
- High-occupancy vehicle (HOV) policies
- High-occupancy toll (HOT) policies
- The regional bike network
- Commuter and light rail
- Next generation *Rapid* buses
- Local buses
- Local Complete Streets program
- Parking management
- Microtransit
- Micromobility
- Pooling by transportation network companies (TNCs)
- E-bikes
- Active transportation demand management
- Smart signals

The proposed Plan also incorporates several demand management strategies, including:

- Teleworking
- Private pooling program
- Vanpool program
- Carshare program
- Regional TDM ordinance
- Transit fare subsidies
- Congestion pricing
- Parking pricing
- Road user charges

The land use strategy in the proposed Plan consists of the SCS land use pattern, which considers jobs-housing balance, mixing of uses, and transit-oriented development. The zero-emission vehicles strategies in the proposed Plan include the regional EV charger program (i.e., San Diego County California Electric Vehicle Infrastructure Project [CALeVIP]) and regional EV incentive program. Refer to Chapter 2, *Project Description*, for additional description of the proposed Plan components that reduce passenger vehicle GHG emissions addressed by SB 375.

The proposed Plan also includes several implementation actions (discussed in Appendix K) that would implement the above strategies, including:

- Near-term Action 3(c), which directs SANDAG to develop a Regional Active Transportation Plan, including an update of the San Diego Regional Bike Plan.

- Near-term Action 8(c), which directs SANDAG to "(l)aunch a regional housing incentive grant program to fund local plan updates in Mobility Hub Areas that can lead to more housing in transit-rich areas with infrastructure, services, and jobs."
- Near-term Action 9(a), which directs SANDAG to "(c)omplete the following studies, plans, and strategies: Electric Vehicle Charger Management Strategy; Medium/Heavy-Duty Zero-Emissions Vehicle Blueprint; Regional Carbon-Reduction Program Feasibility Study; Regional Resilience Framework; Regional Transportation Demand Management Ordinance Policy Analysis." The purpose of the Regional Carbon-Reduction Program Feasibility Study is to identify if such a program would be feasible for SANDAG to implement. If so, SANDAG will continue to work with partners to manage and implement a regionally relevant program.
- Near-term Action 9(e) directs SANDAG to "expand regional programs" for "nature-based climate solutions" with a program that, "expands on the Environmental Mitigation Program to continue regional management and monitoring, restoration, and habitat conservation activities" and "offers carbon-sequestration benefits."
- Near-term Action 9(i), which directs SANDAG to continue to "co-fund and promote" the CALeVIP incentive project, providing rebates for public, workplace, and multifamily electric vehicle charging stations.

The proposed Plan also addresses the reduction of GHG emissions beyond passenger vehicle GHG reductions. For example, relative to existing land use plans, the proposed Plan's compact land use pattern preserves more of the region's natural and working lands instead of converting these lands to urban or developed uses. As a result, more carbon remains stored in soil and vegetation rather than being released into the atmosphere.

Background: Summary and Status of Previously Adopted GHG Mitigation Measures

The 2015 EIR included several mitigation measures to reduce GHG emissions. These are summarized below to provide context for more recent efforts undertaken by SANDAG to reduce GHGs within the San Diego region.

- Mitigation measure GHG 4a, *Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions*, directed SANDAG to revise the *TransNet* Smart Growth Incentive (SGIP) and Active Transportation Grant Program (ATGP) to facilitate local GHG reductions. The revisions included adding criterion to score projects based on their ability to reduce GHG emissions and requiring local jurisdictions to have an adopted CAP as pre-requisite for funding eligibility; SGIP funds were also made available for local jurisdictions to use in preparing a CAP if they had not already adopted one. As of April 2021, the SGIP and ATGP have provided more than $80 million, leveraging $52 million in local match (approximately $132 million dollars invested in the San Diego region) through a competitive grant program to support more than 150 smart growth and active transportation plans, programs, and projects. Implementation of this mitigation measure is complete, and it is not carried over into this EIR. SANDAG continues to operate these grant programs: the next and fifth cycle of the competitive grant programs is planned in December of 2022.
- Mitigation measure GHG-4b, *Adopt a Detailed Regional Mobility Hub Implementation Plan to Reduce GHG Emissions,* directed SANDAG to implement a "Regional Mobility Hub Implementation Strategy" to promote connectivity through investments in mobility hubs. The Regional Mobility Hub Strategy was completed in 2018 and demonstrates how transportation services, amenities, and supporting technologies can work together to make it easier for communities to access transit and other shared mobility choices. It served as an important precursor to the inclusion of major investments in Mobility Hubs as one of the 5 Big Moves in the proposed Plan; as described above, Mobility Hub investments are one of the many strategies that contribute to the proposed Plan meeting its SB 375 target for 2035. Implementation of this mitigation measure is complete, and it is not carried over into this EIR.

- Mitigation measure GHG-4c, *Fund Electric Vehicle Charging Infrastructure*, directed SANDAG to build a network of EV chargers to promote the use of EVs in the San Diego region. As of June 2021, SANDAG has collaborated with local and State agencies, industry, the local utility, and other key stakeholders to inform program development and identify more resources to support EV infrastructure. SANDAG is partnering with the San Diego County Air Pollution Control District, the CEC, and Center for Sustainable Energy on this regional charger program through the CALeVIP. The San Diego County CALeVIP project opened on October 27, 2020, and effectively combined State and regional incentives for EV chargers into one unified program under CALeVIP. The program is providing rebates to offset the purchase and installation costs for public and workplace EV chargers. Funding of more than $17.76 million across both DC fast chargers and Level 2 chargers has been either reserved or provisionally reserved, and 38 percent of funds have been reserved or issued to disadvantaged and low-income communities in San Diego County. Implementation of this mitigation measure is complete, and it is not carried over into this EIR. The CALeVIP program is currently operating. The GHG reductions from CALeVIP are accounted for in the SB 375 GHG emissions reductions that would result from the proposed Plan.
- Mitigation measure GHG-4d, *Adopt a Plan for Transportation Fuels that Reduce GHG Emissions*, directed SANDAG to adopt a regional readiness plan for the deployment of infrastructure for alternative fuels by 2016. On February 26, 2016, the SANDAG Board of Directors accepted the San Diego Regional Alternative Fuel Readiness Plan (Readiness Plan) as a regional resource to advance the deployment of alternative fuel vehicles and infrastructure in support of clean fuel and greenhouse gas emissions–reduction policies. This was done in partnership with the San Diego Regional Clean Cities Coalition and the San Diego County Air Pollution Control District. This effort began in October 2014 with funding from a 2-year, $300,000 CEC grant and established Refuel: San Diego Regional Alternative Fuel Coordinating Council (Refuel San Diego). Refuel San Diego was a multistakeholder group composed of public agencies like SANDAG, alternative fuel vehicle manufacturers, industry representatives, and other stakeholders. Alternative fuels included electricity, biodiesel, ethanol, hydrogen, natural gas, and propane auto gas. Refuel San Diego provided key input to the Readiness Plan. Additionally, SANDAG has supported the implementation of the EV elements of the Refuel Plan through its Plug-in San Diego program, funded by two additional CEC grants. Plug-in San Diego developed resources to reduce barriers to EV infrastructure installations, including an EV charging infrastructure web-based planning tool that launched in 2019. Implementation of this mitigation measure is complete, and it is not carried over into this EIR. These resources now help inform the allocation of funding for EV charging infrastructure through the CALeVIP.

Background: Other SANDAG Plans and Programs to Address GHG Emissions Reductions.

This section describes SANDAG plans and programs that support GHG emissions reductions that are in addition to those that would occur as a result of proposed Plan strategies or the GHG mitigation measures previously adopted in the 2015 Regional Plan.

Final Program Budget for Fiscal Year (FY) 2022

Outside of the proposed Plan, SANDAG's Final Program Budget for Fiscal Year (FY) 2022 includes completion of a scenario planning project to quantify how the region's land conservation efforts are helping the region meet State GHG emissions reduction targets (Work Element 3201900). The FY 2022 budget also allocates funding for activities to further the implementation of local CAPs, including the completion of updates to the Regional Climate Action Planning Framework (ReCAP) and provision of no-cost technical assistance and data to local jurisdictions (Work Element 3201700). It also allocates funding to support local jurisdiction climate adaptation planning (Work Element 3201800).

Regional Climate Action Planning Framework (ReCAP)

In recent years, nearly all of the San Diego region's 19 local jurisdictions have adopted a CAP or are in the process of developing one. Local agency staff members and elected officials communicated that ongoing efforts to adopt, update, and monitor the implementation of CAPs would benefit from regionally consistent approaches, methodologies, and data sources. In response, SANDAG collaborated with local agency staff and leading climate planning experts to prepare ReCAP, which identifies best practices and guidance for preparing CAPs and monitoring implementation over time. ReCAP establishes a technical framework consistent with State goals and policies while preserving local policy flexibility for the unique needs and circumstances of each local jurisdiction.

Climate Action Planning Services for Member Agencies

Since 2016, SANDAG has provided member agencies climate action planning assistance at no-cost through its Roadmap Program. This, coupled with ReCAP and other funding sources, has enabled local jurisdictions to prepare regionally-consistent CAPs and participate in regional monitoring efforts.

Energy Roadmaps and Energy Engineering Services

From 2010 to 2020, SANDAG had a Local Government Partnership (LGP) with SDG&E. The SANDAG LGP was one of five in the region and established the SANDAG Roadmap Program. Initially, the Roadmap Program focused on providing no-cost energy engineering technical support to SANDAG member agencies' municipal operations and in the community. In 2016, SANDAG expanded the technical support to include climate action planning, leveraging LGP funding in conjunction with other resources to ensure delivery of comprehensive services. In addition, SANDAG coordinated with SDG&E, the County of San Diego, the Port of San Diego, and the cities of San Diego and Chula Vista on regional energy efficiency programs through the San Diego Regional Energy Partnership.

Environmental Mitigation Program

Using revenues from the half-cent sales tax for local projects created under the *TransNet* program, SANDAG purchases, conserves, and restores native habitat to offset potential impacts from the development of transportation projects. It provides large-scale acquisition and management of critical habitat areas and creates a reliable approach for funding required mitigation for future transportation improvements. It goes beyond traditional mitigation for transportation projects by allocating funding for habitat acquisition, management, and monitoring activities, as needed, to help implement the Multiple Species Conservation Program and the Multiple Habitat Conservation Program. The program has supported nearly 100 grants to local organizations and jurisdictions for land acquisition and land management efforts, such as invasive species removal. The program also provides funds for the regional management and monitoring of natural habitats and sensitive species. The lands conserved and restored under this program retain carbon stored in soils and vegetation on the region's natural lands and contribute to removal of emissions from the atmosphere.

As of January 2021, the *TransNet* Environmental Mitigation Program (EMP) has awarded $16.4 million through a competitive grant program to support land management throughout the region. An additional $10.1 million of matching funds has been provided by grantees for their Land Management Grant Projects. In addition, the EMP has provided $161 million to acquire and/or restore 8,780 acres of sensitive habitat and open space. A tenth cycle of the competitive land management grant program is planned to be released in the Fall of 2021 and awarded by the Summer of 2022.

Proposed Mitigation Measures to Address the Significant GHG Emissions Impact of the Proposed Plan

The following mitigation measures would help reduce regional GHG emissions by reducing VMT, increasing use of zero-emission fuels, sequestration of carbon from the atmosphere, and other measures; they would reduce inconsistency of the proposed Plan's GHG emissions with the State's ability to achieve the SB 32, EO B-55-18, and EO S-3-05 GHG reduction goals. However, full implementation of the changes required to achieve these goals is beyond SANDAG's and local agencies' current jurisdiction and authority.

As discussed in further detail in Sections 4.3, *Air Quality,* 4.16, *Transportation*, and Section 4.18, *Water Quality*, mitigation measures **AQ-3b**, **AQ-3c**, **AQ-4**, **TRA-2**, **WS-1a**, and **WS-1b** would also reduce emissions of GHGs by decreasing overall pollutant emissions from equipment, vehicles, and water consumption:

- **AQ-3b Reduce Diesel Emissions During Construction from Off-Road Equipment.**
- **AQ-3c Reduce Diesel Emissions During Construction from On-Road Vehicles.**
- **AQ-4 Reduce Exposure to Localized Particulate Emissions.**
- **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects**
- **WS-1a Implement Water Conservation Measures for Transportation Network Improvements**
- **WS-1b Implement Water Conservation Measures for Development Projects**

Program-Level Mitigation

GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans. ~~Prior to December 2025 (adoption of the next Regional Plan), and beginning as soon as~~ No later than December 2023, SANDAG shall implement a grant program(s) that allocate(s) funding on a competitive basis to underfunded GHG-reducing projects that implement the stated strategies or measures in local jurisdiction CAPs or GHG reduction plans. Examples of such projects to reduce GHG emissions include existing building retrofits to reduce electricity or natural gas use or install onsite renewable energy systems, activities at the local level that reduce VMT, Smart Cities[6] measures that result in the reduction of GHG, programs and infrastructure to divert organic waste from landfills, and tree planting.

The ~~purpose of such~~ new and/or revised grant program(s) shall~~is to~~: (1) achieve additional annual GHG emissions reductions during the proposed Plan horizon by implementing projects that would not otherwise occur due to insufficient funding, and (2) achieve additional cumulative GHG emissions reductions under the proposed Plan planning horizon by implementing projects ahead of schedule and realizing GHG reductions earlier than they would otherwise occur due to timing of funding availability. Reducing total annual and cumulative GHG emissions under the proposed Plan planning horizon would reduce the proposed Plan's contribution to climate change.

To be eligible for grant funding, local jurisdictions would be required to have a CAP or GHG reduction plan adopted by the agency's elected decision-making body. Applicants shall provide sufficient evidence in their

[6] Smart Cities use Information and Communications Technology to enhance the quality and performance of public services in order to reduce resource consumption and operate efficiently. Investment in reliable technology and high-speed connectivity are critical to the success of Smart Cities.

funding proposals demonstrating, to SANDAG's satisfaction, that their projects would not be financially feasible, either due to insufficient funding or the timing of funding availability, in the absence of SANDAG funding. Applications shall include estimated GHG emissions reductions from the project, which shall be prepared using established methods or protocols and shall be reviewed and approved by SANDAG. The grant program(s) shall be structured (e.g., using evaluation criteria and/or weighting of evaluation criteria) to prioritize the allocation of ~~allocate~~ funds to projects based on the amount of ~~that make~~ measurable progress they achieve towards achieving the GHG emissions reductions targets identified in that jurisdiction's adopted CAP or GHG reduction plan.

Prior to December 2023, as part of next cycle of the *TransNet* Smart Growth Incentive and Active Transportation Grant Programs Smart Growth Incentive Program SANDAG shall: (1) continue to require locally adopted CAPs or GHG reduction as prerequisites to be eligible for grant funding, and (2) make funding available for local jurisdictions to prepare and update CAPs and GHG reduction plans that keep pace with future longer-term State targets and goals for GHG emissions reductions. Any new or updated CAP or GHG reduction plan receiving funding through this program shall also meet the following minimum criteria:

- The CAP or GHG reduction plan shall be adopted by the jurisdiction's elected decision-making body.
- The CAP or GHG reduction plan shall establish a locally appropriate 2030 GHG reduction target for communitywide GHG emissions derived from the State's legislative target for 2030 (as established by SB 32 or as amended by future legislation), and should establish long-term targets
- The CAP or GHG reduction plan shall quantify, using substantial evidence, how local GHG reduction strategies, programs, and measures would meet or exceed the local GHG reduction target.
- The CAP or GHG reduction plan shall establish a mechanism to monitor the plan's progress toward achieving the target, including reporting data to SANDAG consistent with, and inclusion in, the Climate Action Data Portal or similar database, and a requirement to amend the plan if it is not achieving adopted goals.

Sources of funding that SANDAG shall use include the grants to fund CAP implementation and the Resilient Capital Grants and Innovative Climate Solutions Program (approximately $40 million dollars) identified in the proposed Plan (Table 2-13 in Chapter 2 and Near-Term Actions 9(b) and 9(d) in Appendix K, respectively). SANDAG shall also pursue federal and State partnerships to leverage additional dollars for these programs. SANDAG shall document and report to the SANDAG Board of Directors the activities funded by this grant program and the estimated GHG emissions reductions on an annual basis.

GHG-5b. Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure. ~~Prior to December 2025,~~ SANDAG shall establish one or more new programs to allocate funding for zero-emission buses and infrastructure (e.g., EV charging equipment and/or hydrogen fueling stations), zero-emissions goods movement vehicles (e.g., medium- and/or heavy-duty trucks) and infrastructure, and electric micromobility (e.g., personal electric bikes, cargo delivery electric bikes, neighborhood electric vehicles) and associated infrastructure.

Eligible entities could include but are not limited to public transit operators for zero-emission bus and infrastructure funding; port tenants, distributors, wholesalers, warehouse developers and/or owners, truck owners and/or operators, truck manufacturers, infrastructure providers, and any company that has a fleet of medium- and/or heavy-duty trucks for zero-emission goods movement funding; and local residents, last mile delivery services, and ride-share and/or ride-hail services for electric micromobility funding and associated infrastructure.

SANDAG shall include approximately $100 million by 2025 of the Electric Vehicle Program (Table 2-13 in Chapter 2 and Near-Term Action 9[b] in Appendix K), and approximately $5 million of Transportation Demand Management funding for an electric bike incentive program (Table 2-13 in Chapter 2).

The funding for electric bikes will become available beginning in FY 2022 with the launch of a $500,000 pilot incentive program and will be expanded through FY 2025. This pilot program will reduce GHG emissions by providing funding for, at minimum, 200 electric bikes and associated services.

The funding for zero-emission buses and infrastructure will become available in FY 2023 to enable investments in zero emission transit buses, zero emission school buses, and supporting infrastructure through partnerships with the transit agencies (the Metropolitan Transit System [MTS] and North County Transit District [NCTD]) and San Diego County Air Pollution Control District (APCD). This program will reduce GHG emissions by providing funding for, at minimum, 100 zero-emission buses, as well as associated fueling/charging infrastructure and services.

Beginning in FY 2022 SANDAG will begin two planning strategies to inform transition to zero-emission goods movement: the California Energy Commission-funded Medium Duty/Heavy Duty EV Blueprint grant for San Diego Region in partnership with Port of San Diego, and the Caltrans--funded San Diego and Imperial Counties Sustainable Freight Implementation Strategy. SANDAG will also rely on the Portside Community Emissions Reduction Plan (CERP) and Maritime Clean Air Strategy (MCAS) to inform investment decisions. Investments in goods movement vehicle and infrastructure will begin in FY 2024.

~~Prior to December 2025,~~ SANDAG shall also establish one or more programs to allocate approximately $30 million in funding for public and private light duty vehicle fleets in the San Diego region to install zero-emission vehicle infrastructure and/or purchase zero-emission vehicles (e.g., battery electric vehicles, fuel cell electric vehicles). Eligible entities could include, but are not limited to, school districts, water districts, local jurisdictions, TNCs, private businesses, and non-profit organizations. New funding will be above and beyond that for which reductions in GHG emissions have already been considered as part of the off-model calculations to achieve the SB 375 target.

Beginning in FY 2023, SANDAG will formalize a partnership with CALeVIP San Diego County Incentive Project administrator to make available incentives for fleet charging infrastructure. Beginning in FY 2024, SANDAG will establish a vehicle incentive program that allocates funding incentives for public and private fleet vehicles. This program will reduce GHG emissions by providing funding for a minimum of 5,000 light-duty vehicles and/or chargers.

To further support this mitigation measure, SANDAG shall also participate in federal and State processes to support transportation electrification as well as pursue federal, State, and local partnerships to leverage additional dollars for these programs.

GHG-5c. Implement Nature-Based Climate Solutions to Remove Carbon Dioxide from the Atmosphere. Beginning immediately upon adoption of the proposed Plan and p~~P~~rior to December 2025 (adoption of the next Regional Plan), SANDAG shall establish a Nature-Based Climate Solutions Program that will restore or enhance natural infrastructure that uses or mimics natural processes to benefit people and wildlife. Through this program SANDAG shall implement, or provide funding to implement, projects that restore or enhance native habitats to increase rates of carbon sequestration over baseline conditions. Examples include, but are not limited to, restoring buried or concreted watercourses to riparian habitat to return them to more natural

conditions, restoration of fallow agricultural native coastal sage scrub and chaparral, and removal of fill within salt and freshwater and restoration with wetland habitat.

Prior to implementation of any projects proposed for funding under this program, SANDAG shall prepare, or require the preparation of, studies demonstrating that such proposed projects would increase rates of carbon sequestration over baseline conditions. SANDAG shall document the proposed carbon sequestration for each project receiving funding under this program and provide a report to the SANDAG Board on an annual basis.

SANDAG shall use the Nature-Based Climate Solutions Program (approximately $40 million) identified in the proposed Plan (Table 2-13 in Chapter 2 and Near-Term Action 9(e) in Appendix K) to fund projects under this program. Additional funding could come from the *TransNet* Environmental Mitigation Program Fund for mitigation projects that require restoration and/or land management grants for the restoration of land to native habitat. SANDAG shall also pursue federal and State partnerships to leverage additional dollars for this program.

GHG-5d. Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide. Subsequent to adoption of the proposed Plan and p~~P~~rior to January 2023, SANDAG shall adopt a Regional Digital Equity Strategy and Action Plan that identifies and addresses gaps[7] in accessing affordable, high-quality broadband service (Near-Term Action 6(c) in Appendix K). Access to broadband service allows for remote education, telemedicine, work from home, and the potential for other remote access opportunities that reduce car travel and the associated GHG emissions. Investment in reliable technology and high-speed connectivity are critical to close the digital divide and the foundation of ~~a~~ Smart Cities efforts to become more efficient, use less resources and reduce GHG. The Action Plan will identify specific actions, responsible parties, and a timeline for implementing the strategies identified in the Action Plan. Prior to December 2024, SANDAG commits to researching and evaluating methodologies for ~~and~~ quantifying, where possible, the corresponding GHG reductions~~.~~ associated with improved access to remote services enabled by broadband (e.g., telehealth, remote work, distance learning, and other remote services). SANDAG shall implement the Next OS (approximately $32 million) identified in the proposed Plan (Table B-1, Page B-5 in Appendix K) to fund projects that advance Smart Cities efforts and close the digital divide. SANDAG shall also participate in federal and State processes to support projects that increase access to broadband infrastructure, as well as pursue federal, State, and private partnerships to leverage additional dollars for these programs. SANDAG shall document SANDAG's funding expenditures and progress on implementing the Action Plan and provide a report to the SANDAG Board on an annual basis, ~~Prior to December 2025 (adoption of the next Regional Plan), SANDAG will identify and commit approximately $32 million to undertake projects in the Action Plan that have quantified GHG reductions. SANDAG shall document the funding expenditures and quantified GHG reductions and provide a report to the SANDAG Board on an annual basis~~

~~SANDAG shall implement the Next OS (approximately $32 million) identified in the proposed Plan (Table B-1, Page B-5 in Appendix K) to fund projects that advance smart cities and close the digital divide. SANDAG shall also participate in federal and State processes to support projects that increase access to broadband infrastructure, as well as pursue federal, State, and private partnerships to leverage additional dollars for these~~

[7] This gap is often referred to as the *digital divide*, and represents the growing disparity between members of society who have reliable access to broadband service and an adequate device for connecting to the internet and those who do not—mainly people with limited incomes, seniors, tribal communities, and people in rural areas.

~~programs. SANDAG shall document the progress to expand access to broadband service and provide a report to the SANDAG Board on an annual basis.~~

Project-Level Mitigation

GHG-5e. Implement Measures to Reduce GHG Emissions from Transportation Projects. During the planning, design, project-level CEQA review, construction, operation, and maintenance of transportation network improvements, SANDAG shall, and transportation project sponsors can and should, implement measures to reduce GHG emissions and achieve zero-net energy,[8] including but not limited to applicable transportation project measures from the California Air Pollution Control Officers Association's (CAPCOA) *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA 2010) and the Center for Resource Efficient Communities and the Center for the Built Environment's *Zero-Carbon Buildings in California Feasibility Study* (Center for Resource Efficient Communities and the Center for the Built Environment 2021). ~~These~~ GHG reduction measures include, but are not limited to, the following.

- Implement sustainable construction measures through construction bid specifications, including the following:
    - Use energy and fuel-efficient vehicles and equipment and/or use alternative fuel vehicles and equipment, where applicable.
    - Use lighting systems that are energy efficient, including light-emitting diode (LED) technology.
    - Use lighter-colored pavement, binding agents that are less GHG-intensive than Portland cement, and less-GHG intensive asphalt pavements.
    - Recycle 50–75 percent of construction and demolition waste.
- Install efficient lighting (including LEDs) for traffic, street, and other outdoor lighting.
- Incorporate infrastructure electrification into project design (e.g., EV charging; charging for electric bikes) above minimum code requirements.
- Plan, design and construct all new, upgraded, and regularly maintained infrastructure with electricity demand shall demonstrate how such infrastructure will achieve zero-net energy using onsite innovative technologies (e.g., photovoltaic system, battery storage, energy efficiency) or offsite solutions.
- Incorporate and increase electric vehicle charging equipment and preferred EV parking spots into projects that include commuter parking areas.
- Include design measures (e.g., curb management strategies) to accommodate flexible fleets.
- Install solar photovoltaic canopies over parking areas.
- Design measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse.
- Design measures to reduce water consumption, such as drought-resistant landscaping, smart irrigation systems, and other measures, including those listed in mitigation measures WS-1a and WS-1b in Section 4.18, *Water Supply*.

[8] Zero-net energy describes a state in which the amount of energy provided by onsite renewable-energy sources is equal or equivalent to the amount of energy used.

- Construct buildings to Leadership in Energy and Environmental Design (LEED) certified standards or equivalent standards.

Funding for those measures that SANDAG selects would be included in individual project budgets.

GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects. During the planning, design, project-level CEQA review, construction, and operation of development projects, the County of San Diego and cities can and should implement measures to reduce GHG emissions and achieve zero-net energy, including but not limited to, applicable land use measures in CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA 2010) and the Center for Resource Efficient Communities and the Center for the Built Environment's *Zero-Carbon Buildings in California Feasibility Study* (Center for Resource Efficient Communities and the Center for the Built Environment 2021). These measures include, but are not limited to, the following.

- Measures that reduce VMT by increasing transit use, carpooling, bike-share and car-share programs, and active transportation, including the following:
    - Building or funding a major transit stop within or near development, in coordination with transit agencies.
    - Developing car-sharing and bike-sharing programs.
    - Providing pedestrian network improvements and a comprehensive bicycle network.
    - Providing traffic calming measures.
    - Providing transit incentives, including transit passes for Metropolitan/North County Transit District buses and trolleys.
    - Consistent with the Regional Bike Plan, incorporating bicycle and pedestrian facilities into project designs, maintaining these facilities, and providing amenities incentivizing their use; and planning for and building local bicycle projects that connect with the regional network.
    - Implementing Complete Streets consistent with the SANDAG Regional Complete Streets Policy, including adopting local Complete Streets policies.
    - Implementing Mobility Hubs consistent with the Regional Mobility Hub Strategy.
    - Improving transit access to bus and trolley routes through incentives for constructing transit facilities within developments, and/or providing dedicated shuttle service to trolley and transit stations.
    - <u>Implementing measures to increase transit use through service frequency and affordability as identified through community engagement activities, including but not limited to input from local residents, stakeholders, and Community-Based Organizations.</u>
    - Building low stress bicycle networks including bike trails and connections, lanes, paring, and end of trip facilities.
    - Subsidizing transit service expansion by increasing service hours, decreasing fares, and adding additional transit fleets.
    - Implementing employer trip reduction measures to reduce employee trips and VMT such as vanpool and carpool programs, providing end-of-trip facilities, telecommuting, teleconferencing, and alternative work schedule programs.
    - Incorporating ride hailing and autonomous vehicle innovations.
    - Including design measures (e.g., curb management strategies) to accommodate flexible fleets.
    - Implementing a school bus program in areas currently not served by school buses.

- Measures that reduce VMT through parking strategies based on the SANDAG Regional Parking Management Toolbox, including the following:
    - Parking pricing strategies consistent with the Toolbox.
    - Reduced minimum parking requirements.
    - Residential parking permit programs.
    - Designation of a percentage of parking spaces for ride-sharing vehicles or high-occupancy vehicles, with adequate passenger loading and unloading for those vehicles.
    - Adequate bicycle parking.
    - Other strategies in the SANDAG Regional Parking Management Toolbox.
- Measures that reduce VMT through Transportation Systems Management (TSM), including measures included in Appendix DD of the proposed Plan.
- Land use siting and design measures that reduce GHG emissions, including the following:
    - Developing on infill and brownfields sites.
    - Building high density and mixed-use developments near transit.
    - Developing within areas with high jobs gravity to increase destination accessibility.
    - Orienting development towards transit or an active transport corridor.
    - Retaining onsite mature trees and vegetation, and planting new trees.
- Measures to plan, design, and build all new, renovated, and upgraded development and infrastructure with electricity demand to achieve zero-net energy using onsite innovative technologies (e.g., photovoltaic system, battery storage, energy efficiency) or offsite solutions.
- Measures that increase vehicle efficiency or reduce the carbon content of fuels, including constructing EV charging, alternative fueling stations, or neighborhood electric vehicle networks or charging for electric bicycles consistent with SANDAG's regional readiness planning for alternative fuels.
- Measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse.
- Measures to reduce water consumption, including those listed in mitigation measure WS-1a and WS-1b in Section 4.18.

SIGNIFICANCE AFTER MITIGATION

Mitigation measure GHG-5a would reduce total regional GHG emissions in two ways: (1) allocating funding to under-funded GHG reducing project that implement local jurisdiction CAPs or GHG reduction plans and (2) allocating funding for local jurisdictions to prepare and update CAPs and GHG reduction plans that keep pace with future longer-term State targets and goals for GHG emissions reductions. Providing funding for these projects and plans would (1) achieve additional annual GHG emissions reductions by implementing projects that would not otherwise occur due to insufficient funding; and (2) achieve additional cumulative GHG emissions reductions by implementing projects ahead of schedule and realizing GHG reductions earlier than they would otherwise occur due to timing of funding availability. Reducing total annual and cumulative GHG emissions under the proposed Plan planning horizon would reduce the proposed Plan's inconsistencies with the State's ability to achieve long-term climate goals.

Mitigation measure GHG-5b would reduce total regional GHG emissions by allocating funding for zero-emission buses and infrastructure (e.g., electric vehicle charging equipment and/or hydrogen fueling stations); zero-emissions goods movement vehicles (e.g., medium- and/or heavy-duty trucks) and infrastructure; electric micromobility (e.g., personal electric bikes, cargo delivery electric bikes, neighborhood electric vehicles) and associated infrastructure; and for public and private light duty vehicle fleets in the San Diego region to install zero-emission vehicle infrastructure and/or purchase zero-emission vehicles (e.g., battery electric vehicles, fuel cell electric vehicles). Increasing the amount of vehicle miles traveled by zero emissions vehicles under the proposed Plan horizon would reduce the proposed Plan's inconsistencies with the State's ability to achieve long-term climate goals. Mitigation measure GHG-5c would reduce total regional GHG emissions by creating a program that will restore or enhance natural infrastructure that uses or mimics natural processes to benefit people and wildlife. Through this program SANDAG shall implement, or provide funding to implement, projects that restore or enhance native habitats to increase rates of carbon sequestration over baseline conditions. Increasing the rate of carbon sequestration from natural lands in the region would remove carbon dioxide from the atmosphere, thereby reducing the proposed Plan's inconsistencies with the State's ability to achieve long-term climate goals.

Mitigation measure GHG-5d would reduce total regional GHG emissions by increasing regional access to broadband services, which would displace VMT and associated GHG emissions by replacing vehicle trips with remote access opportunities (e.g., working from home, virtual medical appointments, virtual education). Reducing VMT and associated GHG emissions would reduce the proposed Plan's inconsistencies with the State's ability to achieve long-term climate goals.

Project-level mitigation measure GHG-5e shall be implemented by SANDAG and can and should be implemented by transportation project sponsors to reduce GHG emissions associated with transportation projects. The effectiveness of the actions included in this measure has been demonstrated by CAPCOA and the Center for Resource Efficient Communities and the Center for the Built Environment (CAPCOA 2010, Center for Resource Efficient Communities and the Center for the Built Environment 2021). SANDAG's implementation of this measure during transportation project implementation will reduce total GHG emissions under the proposed Plan. Implementation of this measure by other transportation project sponsors will also reduce total GHG emissions under the proposed Plan; however, SANDAG does not have the authority to require other agencies to implement this measure. It is the responsibility of the implementing agency to determine and adopt project-specific mitigation measures.

Similarly, project-level mitigation measure GHG-5f can and should be implemented by the County of San Diego and cities to reduce GHG emissions from development projects that implement the proposed Plan. The effectiveness of the actions included in this measure has been demonstrated by CAPCOA and the Center for Resource Efficient Communities and the Center for the Built Environment (CAPCOA 2010, Center for Resource Efficient Communities and the Center for the Built Environment 2021). Implementation of this measure by the County of San Diego and cities will also reduce total GHG emissions under the proposed Plan, however, SANDAG does not have the authority to require other agencies to implement this measure. It is the responsibility of the implementing agency to determine and adopt project-specific mitigation measures.

Implementation of mitigation measures GHG-5a through GHG-5f, as well as mitigation measures AQ-3b, AQ-3c, AQ-4, TRA-2, WS-1a, and WS-1b, would substantially lessen the amount of proposed Plan GHG emissions in 2030, 2054, and 2050. However, even full implementation of all identified mitigation measures would not be sufficient to reduce the proposed Plan's GHG emissions to below the regional 2030, 2045, and 2050 reference points based on SB 32, EO B-55-18, and EO S-3-05.

As described in the introduction to mitigation section, the 2017 Scoping Plan establishes the statewide framework for achieving the goal of a 40 percent reduction from 1990 GHG levels in 2030 and put post-2030 statewide emissions on a downward trajectory toward the long-term statewide GHG reduction goals for 2045 and 2050. The 2017 Scoping Plan indicates that to achieve these targets and goals, long-term investments in renewable energy generation, electrified transportation, energy efficient and decarbonized buildings, enhanced industry efficiency, restoration of California's natural and working lands, and sustainable solid waste management are among many actions the State must take. In addition, the State has not adopted a plan analogous to the 2017 Scoping Plan that addresses achieving the EO S-3-05 goal of reducing statewide GHG emissions by 80 percent below 1990 levels by 2050 or the B-55-18 goal of achieving statewide carbon neutrality no later than 2045.

Available research and reports indicate that achieving statewide GHG reduction goals will require major shifts or even fundamental transformations in the economic, social, technological, and political fabric of life in California and beyond, including the development of new technologies, large-scale deployment of new and existing technologies, the roles of local, State, and the federal government in regulating economic activities and personal behaviors that affect GHG emissions. The precise pathway to meeting the State's mid-century goals (e.g., achieving carbon neutrality no later than 2045; reducing emissions to 80 percent below 1990 levels by 2050) is still unclear, but would require the decarbonization of the State's electrical sector, decarbonization of existing buildings and new construction, electrification of the entire transportation sector, investments in healthy soils, sustainable solid waste and wastewater management, and carbon dioxide removal strategies, such as land-based carbon sequestration and direct air capture of CO_2.

The required GHG reductions from the aforementioned sectors will be achieved through a coordinated effort by, at minimum, State, regional, and local agencies, organizations, and stakeholders, and is well beyond the scope and jurisdiction of SANDAG alone. Nevertheless, because the proposed Plan's 2030, 2045, and 2050 GHG emissions would remain inconsistent with the State's ability to achieve 2030, 2045, and 2050 GHG reduction goals, this impact (Impact GHG-5) remains significant and unavoidable.

4.9 HAZARDS AND HAZARDOUS MATERIALS

This section evaluates potential impacts of the proposed Plan related to hazards and hazardous materials.

4.9.1 EXISTING CONDITIONS

HAZARDOUS MATERIALS AND WASTES

Hazardous materials and wastes are defined and regulated in the United States by federal, State, and local agencies, including those administered by the U.S. Environmental Protection Agency (EPA), the California Environmental Protection Agency (CalEPA), the U.S. Occupational Safety and Health Administration (OSHA), the U.S. Department of Transportation (USDOT), the U.S. Nuclear Regulatory Commission, and others. Health and Safety Code Section 25501 defines hazardous material as follows:

> "Hazardous material" means a material listed in paragraph (2) that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment, or a material specified in an ordinance adopted pursuant to paragraph (3).
>
> (2) Hazardous materials include all of the following:
>
> (A) A substance or product for which the manufacturer or producer is required to prepare a material safety data sheet pursuant to the Hazardous Substances Information and Training Act (Chapter 2.5 (commencing with Section 6360) of Part 1 of Division 5 of the Labor Code) or pursuant to any applicable federal law or regulation.
>
> (B) A substance listed as a radioactive material in Appendix B of Part 30 (commencing with Section 30.1) of Title 10 of the Code of Federal Regulations, as maintained and updated by the Nuclear Regulatory Commission.
>
> (C) A substance listed pursuant to Title 49 of the Code of Federal Regulations.
>
> (D) A substance listed in Section 339 of Title 8 of the California Code of Regulations.
>
> (E) A material listed as a hazardous waste, as defined by [Health and Safety Code] Sections 25115, 25117, and 25316.
>
> (3) The governing body of a unified program agency may adopt an ordinance that provides that, within the jurisdiction of the unified program agency, a material not listed in paragraph (2) is a hazardous material for purposes of this article if a handler has a reasonable basis for believing that the material would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment, and requests the governing body of the unified program agency to adopt that ordinance, or if the governing body of the unified program agency has a reasonable basis for believing that the material would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment. The handler or the unified program agency shall notify the secretary no later than 30 days after the date an ordinance is adopted pursuant to this paragraph.

"Hazardous wastes" can be liquids, solids, or contained gases. They can be the byproducts of manufacturing processes, discarded used materials, or discarded unused commercial products such as cleaning fluids (solvents) or pesticides.

Generation, Use, Transport, and Disposal of Hazardous Materials

Businesses that use, store, handle, and/or generate hazardous materials within the San Diego region are monitored at the federal level by EPA, the Department of Toxic Substances Control (DTSC), San Diego Regional Water Quality Control Board (RWQCB), the County of San Diego Department of Environmental Health (DEH) Hazardous Materials Division (HMD); County of San Diego Local Enforcement Agency (LEA) programs, and the County of San Diego Air Pollution Control District (SDAPCD). Several federal laws, regulations, plans, and policies control the storage, use, handling, disposal, and transport of hazardous materials and waste in order to protect public health and the environment. Federal regulations are also in place to protect workers, and to facilitate emergency and evacuation procedures. Select regulations applicable to the proposed Plan are discussed in this section.

A *hazardous waste generator* is any person or facility who produces a hazardous waste as listed or characterized in 40 Code of Federal Regulations (CFR) 261 (EPA 2017) Registered generators of hazardous waste fall into three categories: large-quantity generators (LQGs), small-quantity generators (SQGs), and very small-quantity generators (VSQGs). An LQG is defined as a person or facility generating more than 2,200 pounds of hazardous waste per month. An SQG is defined as generating greater than 220 pound and less than 2,200 pounds of hazardous waste per month. VSQGs are defined as generating 220 pounds or less of hazardous waste per month (EPA 2018b).

LQGs include industrial and commercial facilities, such as manufacturing companies, petroleum refining facilities, and other heavy industrial businesses. LQGs must comply with general federal and State requirements for managing hazardous waste. LQGs need an EPA identification number that is used to monitor and track hazardous waste activities. SQGs include facilities such as service stations, automotive repair, dry cleaners, and medical offices. The regulatory requirements for SQGs are less stringent than the requirements for LQGs. However, SQGs must also obtain an EPA identification number, which must be used for traceability on all hazardous waste documentation. VSQGs are not required by EPA to obtain an EPA ID number or submit a notification form. (EPA 2018b)

Pursuant to federal law, all such generators must register with EPA for record-keeping and recording. The EPA Unified Hazardous Waste and Hazardous Materials Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of six environmental and emergency response programs related to hazardous materials and hazardous waste. The State agencies responsible for these programs set the standards for their program while local governments implement the standards. CalEPA oversees the implementation of the program as a whole.

Historical and present-day activities in the San Diego region have involved the generation, use, transport, and/or disposal of hazardous materials and wastes. Hazardous materials are commonly used in commercial, industrial, agricultural, and (less frequently) residential activities. Documented existing and past generators of hazardous materials throughout the region include commercial uses such as painters, dry cleaners, printers, and photographers; and industrial uses such as automotive service stations, automotive mechanics, sheet metal works, metal scrap yards, truck yards, cement and lime warehouses, coal yards, battery manufacturers, aircraft manufacturers, and electrical substations (SWRCB 2021). Structures built prior to 1973 were commonly manufactured using asbestos-containing materials (ACM) and, prior to 1987, lead-based paint (LBP). Land

throughout the region has historically been used agriculturally where pesticides were commonly used. Additionally, multiple closed and active landfills and former and active military sites are located in the San Diego region. Multiple facilities are permitted to generate, handle, transport, and/or dispose of hazardous materials and wastes.

The following common types of chemicals (among others) are present in the San Diego region:

- Total petroleum hydrocarbons
- Chlorinated volatile organic compounds
- Pesticides
- Lead and other metals
- Asbestos

Although not listed above and not studied historically, emerging chemicals of concern (ECCs) may be important in the future because their risk to human health and the environment is not yet fully understood. Recent studies have shown that some ECCs can act as endocrine disruptors, disrupting normal hormone function, and can produce effects at the parts per billion or parts per trillion level (EPA 2018a). ECCs that are being analyzed with more frequency in the San Diego region include bis-phenol-A, phthalates, arsenic, perchlorate, nonylphenols, synthetic musks and other personal care product ingredients, nitrosodimethylamine, brominated flame retardants, nanoparticles, pharmaceutical wastes, and industrial chemical additives, stabilizers and adjuvants. A full list of ECCs and their fact sheets can be found on the EPA website (EPA 2018a).

Transportation of hazardous materials and wastes in the San Diego region occurs through a variety of modes: truck, rail, air, and pipeline. Several gas transmission pipelines and hazardous liquid pipelines are located in the western portion of the San Diego region and traverse from the international border with Mexico as far north as Orange and Riverside Counties, and as far east as the community of Alpine. Two types of lines are owned by San Diego Gas and Electric (SDGE): gas transmission pipelines, which are generally large-diameter pipelines that operate at pressures above 200 pounds per square inch (psi) and transport gas from supply points to the gas distribution system), and high-pressure distribution mains, which operate at pressures above 60 psi and deliver gas in smaller volumes to the medium-pressure distribution system (NPMS 2018, SDGE 2018).

According to the USDOT Pipeline and Hazardous Materials Safety Administration's *Transportation of Hazardous Materials Biennial Report to Congress 2013-2014*, highway transportation accounts for the largest share of incidents, deaths, and injuries associated with hazardous materials transportation in the United States. Rail accounts for the next largest portion, followed by air and water modes of transport. (USDOT 2016)

Fifty active hazardous waste transporters were registered within the San Diego region as of mid-2018 (DTSC 2018a). Shipments of hazardous materials and wastes include a wide variety of chemicals, such as petroleum products, medical waste, and radioactive materials. Aside from rail and pipeline, hazardous materials are transported within the San Diego region along the same freeways, arterials, and local streets as other traffic (SANDAG 2015).

Identification of Contaminated Sites

Concentrations of chemicals in soil, soil vapor, and groundwater, as well as the lateral and vertical extent can change over time based on the nature of the contaminants identified and the local geology, hydrology, and soil characteristics associated with a specific impacted site. Multiple federal and regional government databases

track and identify sites where hazardous substances may have been released. The following databases contain sites in the San Diego region:

- DTSC, EnviroStor database
- Leaking Underground Storage Tank Sites from the State Water Resources Control Board (SWRCB) GeoTracker database
- Active Cease and Desist Orders (CDOs) and Cleanup and Abatement Orders (CAOs) from the SWRCB
- Active and closed solid waste sites from the Solid Waste Inventory System (SWIS) database maintained by the California Integrated Waste Management Board
- Resource Conservation and Recovery Information System (RCRIS) database of Resource Conservation and Recovery Act (RCRA) facilities maintained by EPA
- The U.S. Army Corps of Engineers (USACE) list of Formerly Used Defense Sites (FUDS)
- Hazardous Materials Establishment Listing maintained by the County of San Diego
- The County of San Diego Site Assessment and Mitigation Land and Water Quality Records database

Hazardous waste sites listed in Government Code Section 65962.5 (Cortese List) are identified in the following databases (CalEPA 2018a):

- DTSC EnviroStor (List of Hazardous Waste and Substances Sites)
- SWRCB GeoTracker (List of Open Active Leaking Underground Storage Tanks
- List of Solid Waste Disposal Site Identified by Water Board with Waste Constituents Above Hazardous Waste Levels Outside the Waste Management Unit, and List of Active CDO and CAO)
- List of Solid Waste Disposal Sites Identified by Water Board with Waste Constituents Above Hazardous Waste Levels Outside the Waste Management Unit
- List of Hazardous Waste Facilities Subject to Corrective Action Pursuant to Section 25187.5 of the Health and Safety Code, Identified by DTSC

These databases are discussed in more detail below.

DTSC EnviroStor Database

EnviroStor is the DTSC data management system for tracking State cleanup, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known contamination or sites that potentially require further investigation. Government Code Section 65962.5 requires CalEPA to prepare an annual Hazardous Waste and Substances List, commonly referred to as the Cortese List. The DTSC EnviroStor database identified 10 hazardous waste and substances sites within the San Diego region as listed in Table 4.9-1 and shown on Figure 4.9-3 (DTSC 2021a) ~~(Table 4.9-1)~~.

Table 4.9-1
Major EnviroStor Hazardous Waste and Substances Sites in the San Diego Region

Facility Name	Facility Type	Cleanup Status	Address/Location
Ketema Aerospace & Electronics	State Response	Active	790 Greenfield Drive, El Cajon 92021
Cabrillo Power II LLC – Miramar Combustion Turbine	State Response	Active	6897 Consolidated Way, San Diego 92121
Former Anacomp Facility	State Response	Active	1895 Hancock Street, San Diego 92110
Camp Lockett (J09CA707800)	State Response	Active	Campo 91906
Sunflower Properties Inc.	State Response	Active	9755 Distribution Avenue, San Diego 92121
Chatham Brothers Barrel Yard	State Response	Active	2257 Bernardo Avenue, Escondido 92029
Camp Elliott-(J09CA0067)	State Response	Active	Northern Portion of San Diego 92103
UCSD (Camp Matthews) (J09CA111001)	State Response	Active	12 Miles North of San Diego, La Jolla 92103
Borrego Sites (J09CA701100 and J09CA701800 and other Anza Borrego Impact Areas)	State Response	Active	Anza Borrego Desert State Park, Borrego Springs 92004
Tri-City Plating, Incorporated	State Response	Active	1307 South Coast Highway, Oceanside 92054

Source: DTSC 2021a.

State Water Resources Control Board GeoTracker Database

The SWRCB maintains the GeoTracker database of the following types of sites in California: permitted underground storage tanks (USTs); leaking underground storage tanks (LUSTs); Department of Defense (DOD) sites; landfills; Voluntary Assistance Program (VAP) sites; and Spills, Leaks, Investigations, and Cleanups (SLIC) sites. According to GeoTracker, there are over 3,000 LUST listings, over 2,500 SLIC listings, 496 military (DOD) listings, and over 100 land disposal listings in the San Diego region (SWRCB 2021). Many of these sites have been remediated to the satisfaction of the respective oversight agency; however, regulations and cleanup levels may have changed since the case closure was received, and many cases were closed based on specific land use at the time of closure and may need to be reopened if land use changes. Thousands of cases remain open for assessment and remediation.

GeoTracker identifies site location, remediation status, chemicals of concern, potential media affected, regulatory activities, and reports including data submitted to the oversight agency, such as contaminant concentrations in monitoring wells. Also listed in the LUST database are sites that fall under the jurisdiction of the RWQCB or Local Oversight Program for unauthorized releases by the County DEH (SWRCB 2018).

State Water Resources Control Board CDO and CAO Database

The list of active CDOs and CAOs from the SWRCB is a compilation of "all cease and desist orders issued after January 1, 1986, pursuant to Section 13301 of the Water Code, and all cleanup or abatement orders issued after

January 1, 1986, pursuant to Section 13304 of the Water Code, that concern the discharge of wastes that are hazardous materials." The orders that are "active," meaning the necessary actions have not yet been completed, are on this list. The list contains many CDOs and CAOs that do not concern the discharge of wastes that are hazardous materials, but the SWRCB's database does not distinguish between these types or orders. The SWRCB updates this list by deleting sites when there is no longer any discharge of wastes or where the necessary cleanup or abatement actions were taken. There are approximately 52 "active" CDO and/or CAO listings in the San Diego region (some facilities have multiple listings) (CalEPA 2021).

Solid Waste Information System Facility Database

The SWIS facility database contains information on solid waste facilities, operations, and disposal sites throughout California. The types of facilities found in this database include landfills, closed disposal sites, transfer stations, materials recovery facilities, composting sites, transformation facilities, waste tire sites, and disposal sites, which include construction, demolition, and inert debris facilities and operations. For each facility, the database contains information about location, owner, operator, facility type, regulatory and operational status, authorized waste types, local enforcement agency, and inspection and enforcement records. There are 190 facility/site listings within the San Diego region that are under the jurisdiction of the County LEA, of which 113 have achieved regulatory closure (CalRecycle 2021).

FORMERLY USED DEFENSE SITES

USACE maintains a list of FUDS within the San Diego region. FUDS are real properties that were under the jurisdiction of the Secretary of Defense and owned by, leased by, possessed, or used by the United States military services. FUDS are located throughout the United States. In many cases, the ownership of these properties has been transferred to private individuals, corporations, State and local governments, federal agencies, and tribal governments. FUDS include, but are not limited to, hazardous, toxic, and radioactive waste, military munitions including munitions constituents, containerized hazardous, toxic, and radioactive waste, building demolition and/or debris removal, and Potentially Responsible Party sites (USACE 2018).

According to a list prepared by USACE in September 2015, there are 47 FUDS at 21 former and current military installations in the San Diego region (USACE 2021). Many FUDS have potential hazardous waste contamination issues such as disposal areas and leaking underground fuel tanks. Other FUDS facilities utilized practice rounds for training, and some used live munitions and explosives. The live munitions that were fired but did not detonate are known as unexploded ordnance (UXO). The UXO that remain on FUDS properties today pose the greatest safety hazard to the public if they are disturbed (County of San Diego 2007). Many FUDS in San Diego County are under investigation by USACE to identify and remediate potential hazards (USACE 2018).

SCHOOLS

The public school system in the San Diego region has roughly 47 school districts with approximately 750 schools throughout the region. In addition to the primary and secondary schools, there are eight community colleges, three public higher education institutions, and several private education schools at all education levels throughout the region (CDE 2018). Almost all land uses have the potential to use, store, transport, and dispose of hazardous materials. Even schools and day care operations may use and dispose of hazardous materials, such as cleaning products or laboratory chemicals, that potentially pose a risk to human health and the environment. In addition, schools are considered sensitive receptors for exposure to hazardous materials.

AIRPORTS

In the San Diego region, the San Diego County Regional Airport Authority has three main responsibilities: operate San Diego International Airport, plan for the future air transportation needs of the region, and serve as the region's Airport Land Use Commission (ALUC) The ALUC is tasked with creating or updating Airport Land Use Compatibility Plans (ALUCPs) for the region's 12 public-use and 4 military airports in accordance with applicable State and federal laws (Figure 4.9-1).

ALUCPs have been adopted for ~~14 of the~~all 16 public-use and military airports in the region. Those airports, with year of adoption of the latest ALUCP are listed below (Airport Authority 2021).

- Agua Caliente Springs Airport (2011)
- Borrego Valley Airport (2011)
- Brown Field (2010)
- Fallbrook Community Airpark (2011)
- Gillespie Field (2010)
- Jacumba Airport (2011)
- Marine Corps Base Camp Pendleton (2008)
- Marine Corps Air Station Miramar (2011)
- McClellan-Palomar Airport (2011)
- Montgomery Field (2010)
- Naval Air Station North Island (2020)
- Naval Outlying Landing Field Imperial Beach (2015)
- Oceanside Municipal Airport (2010)
- Ocotillo Airport (2011)
- Ramona Airport (2011)
- San Diego International Airport – Lindbergh Field (2014)

EMERGENCY RESPONSE AND EVACUATION

Potential disasters for which emergency response and/or evacuations are necessary include earthquakes, floods, pandemic influenza, nuclear accident (e.g., at the now inactive San Onofre Nuclear Generating Station or at an active military installation where nuclear materials may be stored or in transit), terrorism, tsunamis, and wildland fires. Any of these disasters could involve emergency response or evacuation of affected areas. Emergency response plans include elements to maintain continuity of government, emergency functions of governmental agencies, mobilization and application of resources, mutual aid, and public information. Emergency response plans are maintained at the federal, State, and local levels for all types of disasters, human-made and natural. It is the responsibility of government to undertake an ongoing comprehensive approach to emergency management in order to avoid or minimize the effects of hazardous events. Local governments have the primary responsibility for preparedness and response activities. Laws and Regulations governing emergency response and evacuation are discussed in Section 4.9.2, *Regulatory Setting*.

If evacuation is required, local jurisdictions work with the Operational Area Emergency Operations Center, (OAEOC), operated by the San Diego County Office of Emergency Services (OES) (2018b) law enforcement officials, the California Department of Transportation (Caltrans), the California Highway Patrol (CHP), County Public Works, and other applicable agencies/departments to identify evacuation points and transportation routes. In addition, transportation points are identified to collect and transport people without transportation resources to evacuation points. Response is coordinated by the OAEOC.

Any large-scale response to an incident, including those resulting in the evacuation of more than two impacted communities, is coordinated through the OAEOC operating under a unified command. The Coordinator of Emergency Services manages the overall multijurisdictional evacuation effort and the Operational Area Law Enforcement Coordinator is responsible for coordinating operational area-wide evacuation activities. Evacuation operations in the field are conducted by law enforcement agencies, highway/road/street departments, and public and private transportation providers. The following interstates and state highways are identified in the Operational Area Emergency Operations Plan (OES 2018b) as the primary transportation routes for an evacuation effort in the San Diego region: Interstate (I-) 5, I-8, I-15, I-805, and State Route (SR) 52, SR 54, SR 67, SR 75, SR 76, SR 78, SR 94, SR 125, SR 163, and SR 905 (OES 2018b) (Figure 4.9-2). Emergency Response Plans are discussed further in Section 4.9.2.

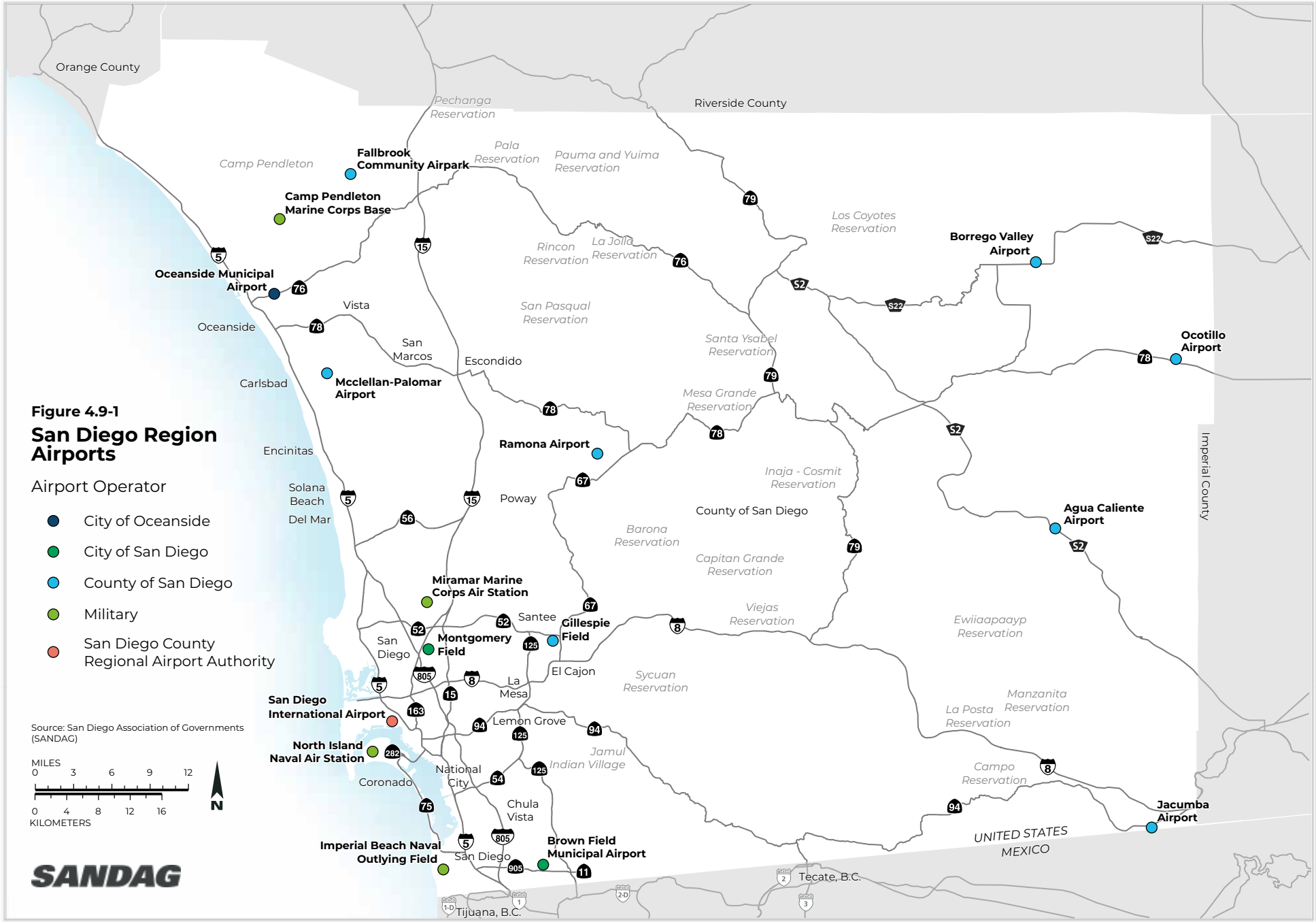

Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Fallbrook Community Airpark
Camp Pendleton Marine Corps Base
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
Borrego Valley Airport
Oceanside Municipal Airport
Vista
San Pasqual Reservation
Oceanside
San Marcos
Escondido
Santa Ysabel Reservation
Ocotillo Airport
Carlsbad
Mcclellan-Palomar Airport
Mesa Grande Reservation
Ramona Airport
Encinitas
Inaja - Cosmit Reservation
Solana Beach
Poway
Del Mar
County of San Diego
Agua Caliente Airport
Barona Reservation
Capitan Grande Reservation
Miramar Marine Corps Air Station
Santee
Gillespie Field
Viejas Reservation
Ewiiaapaayp Reservation
San Diego
Montgomery Field
El Cajon
Sycuan Reservation
La Mesa
San Diego International Airport
Manzanita Reservation
La Posta Reservation
Lemon Grove
North Island Naval Air Station
Jamul Indian Village
Campo Reservation
National City
Coronado
Jacumba Airport
Chula Vista
UNITED STATES
MEXICO
Imperial Beach Naval Outlying Field
San Diego
Brown Field Municipal Airport
Tecate, B.C.
Tijuana, B.C.
Figure 4.9-1
San Diego Region Airports
Airport Operator
City of Oceanside
City of San Diego
County of San Diego
Military
San Diego County Regional Airport Authority
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Figure 4.9-2

Emergency Evacuation Routes in the San Diego Region

Emergency Evacuation Routes

Source: SANDAG 2021

MILES
0 3 6 9 12

0 4 8 12 16
KILOMETERS

N

SANDAG

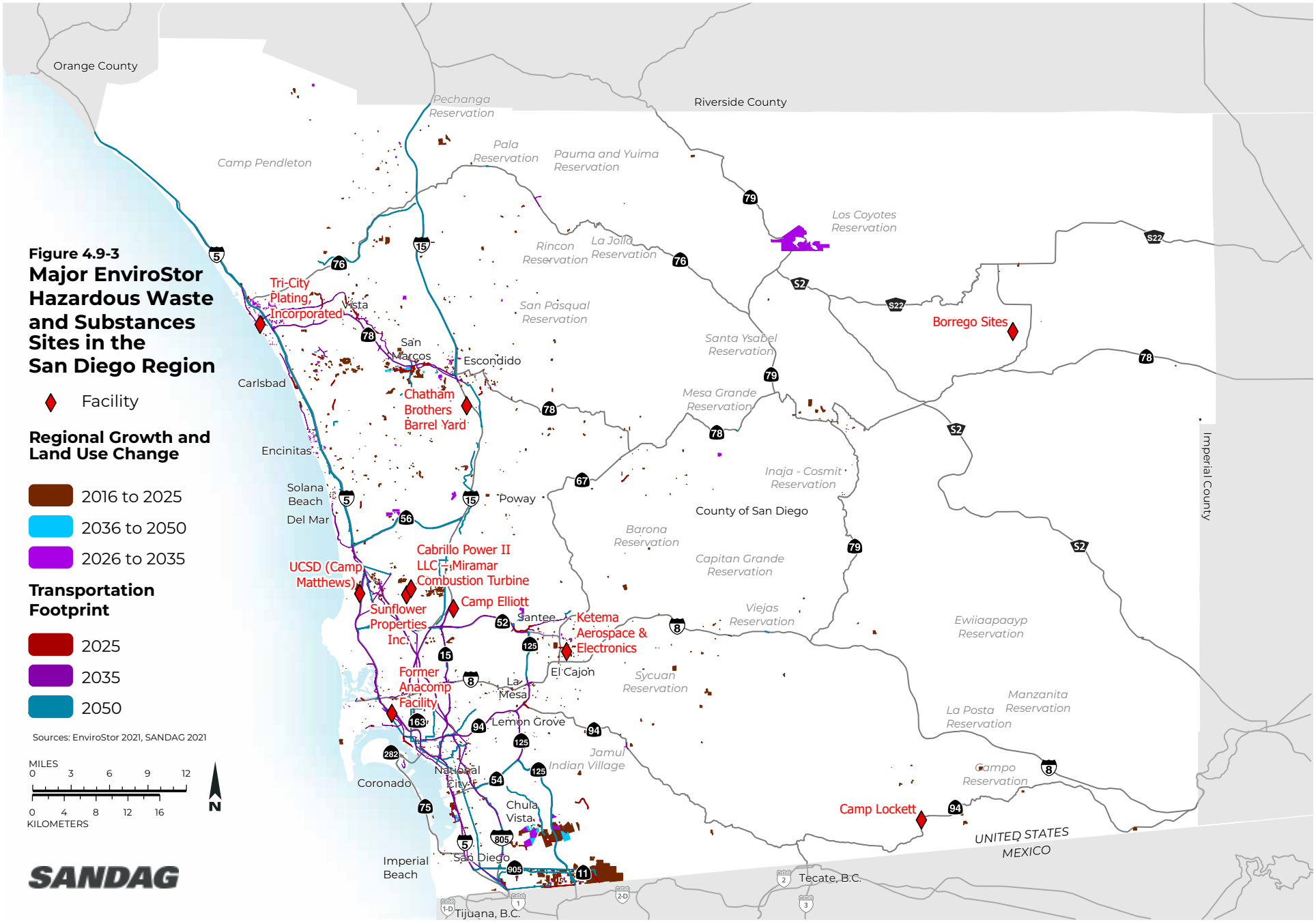


Figure 4.9-3
Major EnviroStor Hazardous Waste and Substances Sites in the San Diego Region
Facility
Regional Growth and Land Use Change
2016 to 2025
2036 to 2050
2026 to 2035
Transportation Footprint
2025
2035
2050
Sources: EnviroStor 2021, SANDAG 2021
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Los Coyotes Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
La Posta Reservation
Manzanita Reservation
Campo Reservation
Jamul Indian Village
County of San Diego
Tri-City Plating, Incorporated
Chatham Brothers Barrel Yard
Cabrillo Power II LLC, Miramar Combustion Turbine
UCSD (Camp Matthews)
Sunflower Properties Inc.
Camp Elliott
Ketema Aerospace & Electronics
Former Anacomp Facility
Borrego Sites
Camp Lockett
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

Climate change may increase risk from hazards due to sea-level rise submerging coastal lands, more frequent and severe flooding, higher temperatures, and higher incidence of wildfire. The San Diego region is likely to experience sea level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix C.

Many of the impacts of climate change are hazardous to human lives and the infrastructure they depend upon. The region may also face various indirect impacts of climate change, such as worsened air quality, higher rates of temperature-related illnesses and diseases, landslides, and beach erosion. Climate change may also worsen hazards in the region associated with hazardous materials, sensitive infrastructure, dangers to public health, and obstructions of emergency response.

Flooding of hazardous material sites could introduce toxic substances to human and environmental health by contaminating drinking water supplies, buildings, and ecosystems. Hazardous material sites include Superfund sites, hazardous waste generators, facilities required to report emissions for the Toxics Release Inventory, facilities regulated under the National Pollutant Discharge Elimination System, major dischargers of air pollutants with Title V permits, and brownfield properties. Heberger et al. (2009) found no hazardous material sites in the San Diego region in areas vulnerable to a 100-year flood event. However, a 1.4-meter (4.6-foot) rise in sea level could bring 13 of the regional sites into areas vulnerable to a 100-year storm (Heberger et al. 2009). Note, however, that this 1.4-meter sea level rise scenario is the upper limit of current estimates in the San Diego region; it is not clear how many sites would be within the inundation zones under other scenarios. Thus, the potential impacts of climate change-related sea level rise on hazardous material sites in the San Diego region would vary depending on the degree of climate change, and resulting sea level rise, that occurs.

A combination of sea-level rise and storm flooding may obstruct emergency response routes, vehicles, and plans in the case of an emergency. In San Diego County, a 1.4-meter rise in sea level could make more vehicle infrastructure along the coast vulnerable to a 100-year storm. This sea-level rise would bring 8 miles of highways (compared to 0.62 mile in 2000), 57 miles of roads (compared to 12 miles in 2000), and 9.8 miles of railways (compared to 3 miles in 2000) into vulnerable areas (Heberger et al. 2009). Once again, this 1.4 meter of sea-level rise is in the upper limit of current estimates of sea-level rise in the San Diego region, and it is uncertain if those current estimates will bring highways and roads into areas vulnerable to flooding from a 100-year storm. More frequent wildfires, occurring due to increased temperatures and periods of drought due to climate change, may also obstruct roads for emergency vehicles, though the probability and extent of this occurring is unknown.

4.9.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Hazardous Materials and Wastes

Toxic Substances Control Act of 1976

The Toxic Substances Control Act of 1976 (15 United States Code [USC] 2601 et seq.) addresses the production, importation, use, and disposal of polychlorinated biphenyls (PCBs), asbestos, ACMs and LBP. Sections of the act provide EPA with the authority to require reporting, record-keeping, and testing requirements; and implement

restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from the act, including, among others, food, drugs, cosmetics, and pesticides.

Asbestos Hazard Emergency Response Act

The Asbestos Hazard Emergency Response Act (15 USC 2641 et seq.) requires local schools to inspect buildings for ACM, prepare asbestos management plans, and implement response actions to reduce and prevent asbestos hazards .

Resource Conservation and Recovery Act of 1976

The Resource Conservation and Recovery Act ("RCRA," 42 USC § 6991 et seq.) establishes a framework for the EPA to manage the generation, treatment, and disposal of solid and hazardous wastes. The statute also addresses program administration; implementation and delegation to the states; enforcement provisions and responsibilities; and research, training, and grant funding. Provisions are established for the generation, storage, treatment, and disposal of hazardous waste, including requirements addressing generator record keeping, labeling, shipping paper management, placarding, emergency response information, training, and security plans The Hazardous and Solid Waste Amendments of 1984 amended the RCRA to phase out land disposal of hazardous waste, require corrective action for releases, set stringent hazardous waste management standards, and establish a comprehensive underground storage tank program. In California, DTSC is responsible for RCRA program implementation. 40 CFR 239–259 includes regulations for solid waste; regulations governing identification, classification, generation, management, and disposal of hazardous waste are described in parts 40 CFR 260–273. Regulations governing management of used oil and USTs can be found in 40 CFR 279–282.

Oil Pollution Prevention

Oil pollution prevention regulations (40 CFR 112)establish procedures, methods, and other requirements to prevent the discharge of oil from non-transportation-related facilities. The regulations require the preparation of a Spill Prevention, Control, and Countermeasure (SPCC) Plan if oil is stored in excess of 1,320 gallons aboveground in containers with a capacity of 55 gallons or more (or have a buried capacity of 42,000 gallons). SPCC regulations also place restrictions on the management of petroleum materials.

Clean Air Act Amendments Risk Management Rule

Section 112(r) of the 1990 Clean Air Act Amendments requires EPA to publish regulations and guidance for chemical accident prevention at facilities that use extremely hazardous substances. These regulations and guidance are contained in the Risk Management Plan (RMP) rule (40 CFR 68), which requires companies using more than a threshold amount of specified regulated substances to develop an RMP. RMPs are required to include the potential effects of an accidental release, identify safety and prevention programs, and describe emergency response procedures in the event of an accidental release. They must be revised and resubmitted to EPA every 5 years. In California, responsibility for the Risk Management Program is delegated to the OES. The list of federally regulated substances and federally regulated flammable substances and their threshold quantities can be accessed online from the OES website (http://www.caloes.ca.gov/).

National Emission Standards for Hazardous Air Pollutants, Subpart M – National Emission Standard for Asbestos

EPA has established National Emission Standards for Hazardous Air Pollutants, including ACM. (49 CFR 61.140 et seq.) The use, removal, and disposal of ACM are regulated by EPA, which requires notification of friable ACM removal prior to a proposed demolition project.

Emergency Planning and Community Right-to-Know Act

The Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 (42 USC 116 et seq.) was created to help communities plan for chemical emergencies and also requires facilities to report on the storage, use and release of hazardous materials and wastes. The act provides public access to information about chemical hazards. The EPCRA and its regulations (40 CFR 350–372) establish four types of reporting obligations for facilities storing or managing chemicals: emergency planning, emergency release notification, hazardous chemical storage reporting requirements, and toxic chemical release inventory. EPA maintains a database—the Toxic Release Inventory—that includes information on reportable releases to the environment.

Comprehensive Environmental Response, Compensation, and Liability Act

Thousands of contaminated sites exist nationally due to hazardous waste being dumped, left out in the open, or otherwise improperly managed. These sites include manufacturing facilities, processing plants, landfills and mining sites. The Comprehensive Environmental Response, Compensation, and Liability Act (42 USC 9601 et seq.), also known as the Superfund program, established a program to clean up uncontrolled or abandoned hazardous waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. EPA cleans up orphan sites when potentially responsible parties cannot be identified or located, or when they fail to act. EPA developed risk-based "regional screening levels" for chemical contaminants at Superfund sites. Regional screening levels are concentrations of hazardous constituents that are considered to be protective for humans (including sensitive groups) over a lifetime. In California, site identification, monitoring, and response activities are coordinated through DTSC.

Occupational Safety and Health Act

Under this act (29 USC 651 et seq.) and its regulations (29 CFR 1910.1220 et seq.), facilities that use, store, manufacture, handle, process, or transport hazardous materials are required to conduct employee safety training; inventory safety equipment relevant to potential hazards; have knowledge on safety equipment use; prepare an illness prevention program; provide hazardous substance exposure warnings; prepare an emergency response plan; and prepare a fire prevention plan.

OSHA standards require employee training; personal protective equipment; safety equipment; and written procedures, programs, and plans for ensuring worker safety when working with hazardous materials or in hazardous work environments during construction activities, including renovations and demolition projects and the handling, storage, and use of explosives. These standards also provide rules for the removal and disposal of hazardous materials including ACM, LBP, and other lead-containing materials.

Hazardous Materials Transportation Act

The Hazardous Materials Transportation Act (49 USC 100 et seq.) regulates the transportation of hazardous materials under the authority of the Secretary of Transportation. A hazardous material, as defined by the

Secretary of Transportation, is any "particular quantity or form" of a material that "may pose an unreasonable risk to health and safety or property."

The act governs the safe transportation of hazardous materials by various transportation modes including trucks, rail, air, water, and transport by pipeline. USDOT regulations that govern the transportation of hazardous materials are applicable to any person who transports, ships, causes to be transported or shipped, or who is involved in any way with the manufacture or testing of hazardous materials packaging or containers. USDOT regulations pertaining to the actual movement govern every aspect of the movement, including packaging, handling, labeling, marking, placarding, operational standards, and highway routing. Additionally, USDOT is responsible for developing curriculum to train for emergency response and administers grants to states and Indian tribes for ensuring the proper training of emergency responders (USDOT 2019.

Federal Insecticide, Fungicide, and Rodenticide Act

The use of pesticides is regulated by the EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (7 USC 136 et seq.), which creates the foundation for regulation, sale, distribution, and use of pesticides in the United States. EPA is authorized to review and register pesticides for particular uses. Additionally, EPA is authorized to suspend or cancel the registration of a pesticide if research shows the continued use would create an unreasonable risk.

Airport Safety

Federal Aviation Regulations

Federal Aviation Administration (FAA) regulations (14 CFR 77) imposes height restrictions to prevent obstructions to navigable airspace to protect flights and surrounding structures. These regulations establish requirements for notifying the FAA of certain construction activities and alterations to existing structures, to ensure there are no obstructions to navigable airspace. In certain cases, the FAA should be notified of proposed development. The notification of proposed development provides a basis for the following:

- Evaluating the effect of the construction or alteration on operational procedures and proposed operational procedures
- Determining the possible hazardous effect of the proposed construction or alteration of air navigation
- Recommending ways to identify the construction or alteration in accordance with current FAA Advisory Circular AC 70/7460-1K dated August 1, 2000, Obstruction Marking and Lighting
- Determining other measures to be applied for continued safety of air navigation
- Charting and other notification to airmen of the construction or alteration
- Providing regulations for small unmanned aircraft (drones)

Certain projects that may affect public and military airports require notification to the FAA. Individual jurisdictions can request an FAA evaluation of proposed development when certain features appear to be potentially hazardous.

U.S. Department of Defense Air Installations Compatible Use Zone Program

Safety compatibility criteria for U.S. military air bases are set forth through the Air Installations Compatible Use Zone (AICUZ) Program administered by the DOD. The objective of this program is to encourage compatible uses

of public and private lands proximate to military air installations through the local communities' comprehensive planning process. DOD creates AICUZ plans for all major military air installations. The plans recommend land uses that may be compatible with air installations noise levels, and accident potential and flight clearance requirements associated with military airfield operations. AICUZ plans generally contain three safety zones: Clear Zones and two Accident Potential Zones (APZs). A Clear Zone is the area immediately beyond the end of the runway, which has the highest potential of accidents. These are typically acquired by the government in fee and kept clear of obstructions to flight. APZ-1 is the area immediately beyond the Clear Zone that possesses a significant potential for accidents. APZ-2 is the area beyond APZ-1 that still has a measurable potential for accidents. AICUZ descriptions of these three zones are intended to be guidelines for compatible land use planning. Because military installations often lack land use authority over the extent of an AICUZ, it is the responsibility of the relevant jurisdictions to ensure incompatible uses are either not permitted or properly regulated (NAVFAC 2018).

Natural Disaster

Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 (Public Law 106-390) provides the legal basis for Federal Emergency Management Agency (FEMA) mitigation planning requirements for state, local, and Indian Tribal governments as a condition of mitigation grant assistance. A state mitigation plan is required as a condition of disaster assistance, adding incentives for increased coordination and integration of mitigation activities at the state level.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 USC 5121) is designed to assist the efforts of the affected states in expediting the rendering of aid, assistance, and emergency services, and the reconstruction and rehabilitation of devastated areas. The act provides the statutory and regulatory framework for most federal disaster response activities especially as they pertain to FEMA and FEMA programs, and allows for a presidential declaration of an emergency or a declaration of a major disaster, which in turn allows for a wide range of federal resources to be made available to assist in dealing with an emergency or major disaster.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

Hazardous Materials

California Hazardous Waste Control Law of 1972

This legislation (Health and Safety Code Section 25100 et seq) created the framework under which hazardous wastes must be managed in California. It provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA program. It also provides for the designation of California-only hazardous wastes and development of standards that are equal to or, in some cases, more stringent than, federal requirements. Each Certified Unified Program Agency (CUPA) is responsible for implementing some elements of the law at the local level.

California's hazardous waste laws are collectively known as the Hazardous Waste Control Law (Health and Safety Code Section 25100 et seq.). Under the CUPA program, Cal/EPA has, in turn, delegated enforcement authority to the County of San Diego for State law regulating hazardous waste producers or generators. The County of San Diego is the designated CUPA for all local jurisdictions within the project area

Environmental Health Standards for the Management of Hazardous Waste

These regulations (22 California Code of Regulations [CCR], Division 4.5) establish requirements for the management and disposal of hazardous waste in accordance with the provisions of the California Hazardous Waste Control Act and federal RCRA. As with federal requirements, waste generators must determine if their wastes are hazardous according to specified characteristics or lists of wastes. Hazardous waste generators must obtain identification numbers; prepare manifests before transporting waste off site; and use only permitted treatment, storage, and disposal facilities. Standards also include requirements for record keeping, reporting, packaging, and labeling. Additionally, while not a federal requirement, California requires that hazardous waste be transported by registered hazardous waste transporters.

In addition, these regulations require that generators of 12,000 kilograms/year of typical, operational hazardous waste evaluate their waste streams every 4 years and, as applicable, select and implement viable source reduction alternatives. The California Hazardous Waste Control Act does not apply to nontypical hazardous waste, such as ACM and PCBs.

California Environmental Protection Agency – Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

The Unified Hazardous Waste and Hazardous Materials Program (Unified Program [Health and Safety Code Section 25404 et seq.])governs administrative requirements, permits, inspections, and enforcement in California. Under CalEPA, DTSC and Enforcement and Emergency Response Program administer the technical implementation of the Unified Program, which consolidates the administration, permit, inspection, and enforcement activities of several environmental and emergency management programs at the local level (CalEPA 2018). CUPAs implement the hazardous waste and materials standards. The following programs make up the Unified Program:

- Aboveground Petroleum Storage Act Program
- Area Plans for Hazardous Materials Emergencies
- California Accidental Release Prevention (CalARP) Program
- Hazardous Materials Release Response Plans and Inventories/Hazardous Materials Business Plans
- Hazardous Material Management Plan and Hazardous Material Inventory Statements
- Hazardous Waste Generator and On-site Hazardous Waste Treatment (Tiered Permitting) Program
- Underground Storage Tank Program

The San Diego County DEH HMD has been certified by CalEPA as the local CUPA. Thus, the DEH HMD is responsible for implementing the federal and State laws and regulations for all jurisdictions within the San Diego region.

Carpenter-Presley-Tanner Hazardous Substance Account Act

The Carpenter-Presley-Tanner Hazardous Substance Account Act (Health and Safety Code Section 25300 et seq.) establishes a State Superfund program to clean up contaminated sites not listed on the National Priorities List. The act authorizes DTSC to initiate remedial and removal actions, and to enter into enforceable agreements with potentially responsible parties to investigate and remediate contamination.

Proposition 65

Proposition 65 (Health and Safety Code Section 25249.5 et seq.; 22 CCR 12000 et seq.), also known as the Safe Drinking Water and Toxic Enforcement Act of 1986, requires that regulated businesses not expose persons to significant concentrations of carcinogens or reproductive toxicants without providing a "clear and reasonable" warning. Additionally, regulated businesses must not discharge or release any listed carcinogens or reproductive toxicants that potentially may contact a source or potential source of drinking water.

California Accidental Release Prevention Program

In California, the accidental release Risk Management Plan Program is the CalARP program (Health and Safety Code Section 25531–25543.3). The program addresses facilities that contain specified hazardous materials, known as "regulated substances," that, if involved in an accidental release, could result in adverse off-site consequences. The CalARP program is implemented at the local government level by CUPAs. The CalARP program is designed so these agencies work directly with the regulated businesses. The CUPAs determine the level of detail in the RMPs, review the RMPs, conduct facility inspections, and provide public access to most of the information (CAL OES 2014a).

Department of Toxic Substances Control

DTSC regulates hazardous waste in California under the federal RCRA program and the California Health and Safety Code. It implements permitting, inspection, compliance, and corrective action programs to ensure that hazardous wastes are managed in compliance with State and federal requirements. DTSC also oversees the implementation of the hazardous waste generator and onsite treatment program at the local level consolidated within the CUPA Program

The DTSC Enforcement and Emergency Response Program (Enforcement Program) is composed of multiple program components to provide statewide response to actual and potential release of hazardous materials that pose an acute threat to public health or the environment. The Enforcement Program conducts inspections and takes enforcement action at facilities for which permits have been issued by DTSC including transporters, some generators of hazardous waste, and electronic waste handlers. The Enforcement Program responds statewide to calls requesting DTSC assistance for emergency removals from illegal/clandestine drug labs and other hazardous materials emergencies. Requests for assistance are handled by the Enforcement Program's Emergency Response Duty Officers (DTSC 2018c).

EnviroStor is a search tool for DTSC that tracks information on contaminated sites in California, as well as information on permitting and enforcement. Searching is available by city, zip code, and senate and assembly districts, as well as county. Outputs are available both as a list of sites or a map of an area with cities highlighted in colors according to their status and site type (DTSC 2021b).

EnviroStor's site database contains a list of contaminated sites as well as lists of facilities that process or transfer toxic waste. The database includes federally designated sites, State response sites, military sites, school sites, and voluntary cleanup sites.

Hazardous Materials Business Plan Program

The intent of the Hazardous Materials Business Plan Program (Health and Safety Code Sections 25500-25519) is to provide necessary information to first responders in order to prevent or minimize damage to public health and safety and the environment from a release or threatened release of hazardous materials. The program does

so by requiring businesses that handle hazardous materials in quantities equal to or greater than 55 gallons of a liquid, 500 pounds of a solid, or 200 cubic feet of compressed gas, or extremely hazardous substances above the threshold planning quantity to: inventory their hazardous materials, develop a site map, develop an emergency plan, and implement a training program for employees. This program implements Section 312 reporting requirements of the federal EPCRA (CAL OES 2014b).

Aboveground Petroleum Storage Act

The Aboveground Petroleum Storage Act (Health and Safety Code Section 25270 et seq.) applies to owners and operators with a total storage capacity of 1,320 gallons or more. The act transfers the authority and responsibility of aboveground storage tanks from the SWRCB and RWQCB to the CUPAs, and requires owner/operators of a regulated tank facility to prepare and implement a SPCC Plan. The CUPA is required to conduct inspections at regulated tank facilities with an aggregate storage capacity greater than or equal to 10,000 gallons of petroleum at least every 3 years.

California Land Environmental Restoration and Reuse Act

The California Human Health Screening Levels (CHHSL) were developed as a tool to assist in the evaluation of contaminated sites for potential adverse threats to human health. Preparation of the CHHSL was required by the California Land Environmental Restoration and Reuse Act.

The CHHSL are concentrations of 54 hazardous chemicals in soil or soil gas that are below CalEPA's thresholds of concern for risks to human health. The CHHSL were developed by the Office of Environmental Health Hazard Assessment (OEHHA)and can be found in *Human-Exposure-Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil (*OEHHA 2005*)* The thresholds of concern used to develop the CHHSL are an excess lifetime cancer risk of 1 in 1 million and a hazard quotient of 1.0 for noncancerous health effects. The CHHSL were developed using standard exposure assumptions and chemical toxicity values published by EPA and CalEPA. The CHHSL can be used to screen sites for potential human health concerns where releases of hazardous chemicals to soils have occurred. Under most circumstances, the presence of a chemical in soil, soil gas, or indoor air at concentrations below the corresponding CHHSL can be assumed to not pose a significant human health risk. (OEHHA 2018).

Emergency Response to Hazardous Materials Incident

California's Emergency Response Plan (OES 2018b)coordinates emergency services provided by federal, State, and local government, and private agencies. The California Emergency Management Agency (Cal EMA) administers the plan, which includes response to hazardous materials incidents. Cal EMA also coordinates the response of other agencies, including CalEPA, CHP, California Department of Fish and Wildlife, Regional RWQCB, SDAPCD, the City of San Diego Fire Department, and DEH Hazardous Incident Response Team.

Underground Storage Tank Act

The UST monitoring and response program is required under Health and Safety Code Section 5280 et seq. and 22 CCR 2630). The program ensures that facilities meet regulatory requirements for design, monitoring, maintenance, and emergency response when operating or owning USTs. The County of San Diego DEH is the local administering agency for this program.

California Department of Transportation/California Highway Patrol

California regulates the transportation of hazardous waste originating or passing through the state. The CHP and Caltrans have primary responsibility for enforcing federal and State regulations and responding to hazardous materials transportation emergencies. CHP enforces materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provides detailed information to cleanup crews in the event of an incident. CHP also oversees vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation. CHP conducts regular inspections of licensed transporters to ensure regulatory compliance. Caltrans has emergency chemical spill identification teams at locations throughout the state. Hazardous waste must be regularly removed from generating sites by licensed hazardous waste transporters. Unless specifically exempted, it is unlawful in California for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC, which maintains a list of active registered hazardous waste transporters throughout California. Transported hazardous waste must be accompanied by hazardous waste manifests. (22 CCR 66263.10 et seq.).

State Pesticide Regulation

In California, all pesticides must be registered by the Department of Pesticide Regulation (DPR). DPR is authorized to deny registration for pesticides having a significant adverse and unavoidable impact unless the benefit clearly outweighs the risks (3 CCR 6158). People in the pest control business must register with the county agricultural commissioner and hold a pest control license issued by DPR. Applicators of some restricted use pesticides also may require a permit from the county agricultural commissioner (Food and Agricultural Code Section 14004 et seq.),

Schools

Phase I ESA Requirements

Education Code Section 17213.1 requires that DTSC be involved in the environmental review process for the proposed acquisition and/or construction of school properties that will use State funding. The CEC requires that a Phase I Environmental Site Assessment (ESA) be completed prior to acquiring a school site or engaging in a school construction project. Depending on the outcome of the Phase I ESA, a Preliminary Endangerment Assessment, including the collection and submittal of samples for analysis, may be warranted. Depending upon the results of the Preliminary Endangerment Assessment, remediation may be necessary (DTSC 2001).

Airport Safety

State Aeronautics Act

The State Aeronautics Act (Public Utilities Code Section 21675) requires each ALUC establish an ALUCP to provide for the orderly growth of each public airport and the surrounding area within the jurisdiction of the commission.

An ALUCP focuses on a defined area around each airport known as the Airport Influence Area (AIA). Additionally, airport safety zones are established for all public airports as part of the ALUCP, and land use restrictions within safety zones are established to protect people and property on the ground and in the air. The AIA is composed of noise, safety, airspace protection, and overflight factors, in accordance with guidance from the *California Airport Land Use Planning Handbook* published by the California Department of Transportation, Division of Aeronautics (Caltrans 2011, Airport Authority 2021).

The ALUC reviews land use plans, development proposals, and certain airport development plans for consistency with adopted ALUCPs. ALUCPs provide guidance on appropriate land uses surrounding airports to protect the health and safety of people and property within the vicinity of an airport, as well as the public in general. The ALUC has no jurisdiction over the operation of airports or over existing land uses, regardless of whether such uses are incompatible with airport activities. Once ALUCPs have been adopted by the ALUC, local agencies with land located within the AIA boundary for any of the airports must amend their planning documents to conform to the applicable ALUCP, unless they follow certain procedures to overrule the ALUCP. (Government Code Section 65302.3)

The four compatibility factors considered in an ALUCP as identified in the *California Airport Land Use Planning Handbook* are noise, safety, airspace protection, and overflight. The objectives of planning for each of these factors are summarized below:

Noise: Avoid introducing new noise-sensitive land uses in the vicinity of an airport that would be exposed to significant levels of aircraft noise, taking into account the characteristics of the airport and the communities surrounding the airport.

Safety: Minimize the risks associated with potential off-airport aircraft accidents and emergency landings. This objective has two components:

Safety on the Ground: Provide for the safety of people and property on the ground in the event of an aircraft accident near an airport.

Safety of Aircraft Occupants: Enhance the chances of survival of the occupants of an aircraft involved in an accident beyond the immediate runway area.

Airspace Protection: Avoid the development of land use conditions that, by posing hazards to flight, can increase the risk of an accident occurring. The particular hazards of concern are:

- Airspace obstructions;
- Wildlife hazards, particularly bird strikes; and
- Land use characteristics that pose other potential hazards to flight by creating visual or electronic interference with air navigation.

Overflight: Avoid, to the extent possible, new land use development that would be disrupted by overflight activity and might lead to annoyance and complaints; notify people about the presence of aircraft overflights near airports so they can make informed decisions regarding acquisition or lease of property.

Caltrans Division of Aeronautics

The Caltrans Division of Aeronautics issues permits for, and annually inspects hospital heliports and public-use airports, makes recommendations regarding proposed school sites within 2 miles of an airport runway, and authorizes helicopter landing sites at/near schools. If Caltrans does not support a proposed school site, the school district or charter school may not acquire or lease the site, and no State or local funds can be used to acquire the site or construct the school (Caltrans 2018).

Disaster Recovery/Natural Disasters

State Hazard Mitigation Plan

The State Hazard Mitigation Plan (CAL OES 2018)is California's primary hazard mitigation guidance document and provides an updated and comprehensive description of the State's historical and current hazard analysis, mitigation strategies, goals, and objectives. Approved by FEMA on September 28, 2018, as an Enhanced State Mitigation Plan, the plan continues to build upon California's commitment to reduce or eliminate the impacts of disasters caused by natural, technological, accidental, and adversarial/human-caused hazards, and further identifies and documents progress made in hazard mitigation efforts, new or revised State and federal statutes and regulations, and emerging hazard conditions and risks that affect the State of California.

California Emergency Services Act

The California Emergency Services Act (Government Code Section 8550 et seq.) provides the basic authority for conducting emergency operations following a proclamation of emergency by the governor and/or appropriate local authorities. Local government and district emergency plans are considered extensions of the California Emergency Plan, established in accordance with the Emergency Services Act.

California Disaster Assistance Act

The California Disaster Assistance Act (CDAA) (Government Code Sections 8680–8692) provides aid to local agencies to assist in the permanent restoration of public real property, other than facilities used solely for recreational purposes, in cases where property has been damaged or destroyed by a natural disaster. The CDAA is activated after the following occurs: (1) a local declaration of emergency, or (2) Cal EMA gives concurrence with the local declaration, or (3) the governor issues a Proclamation of a State Emergency. Once the CDAA is activated, local government is eligible for certain types of assistance, depending upon the specific declaration or proclamation issued.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

Hazardous Materials

County of San Diego Department of Environmental Health

The County of San Diego DEH HMD has been the CUPA for San Diego County since 1996. All inspections in the CUPA Program are performed by trained Environmental Health Specialists who take part in a continuous education program to ensure consistency and uniformity during inspections. These inspections determine compliance with the following:

- Hazardous Waste Control, Aboveground Storage of Petroleum, Underground Storage of Hazardous Substances, California Toxic Release Inventory Program (Health and Safety Code Chapters 6.5, 6.67, 6.7, and 6.95, respectively)
- Medical Waste Management Act (Division 104, Part 14)
- Public Safety and Underground Storage Tank Regulations (CCR Titles 19 and 23, respectively)
- Inventory, Emergency Response, and Employee Training (Health and Safety Code 25503) (County of San Diego 2017a)

County of San Diego Site Assessment and Mitigation Program

The primary goal of the San Diego County DEH Site and Mitigation (SAM) Program is to protect human health, water resources, and the environment within San Diego County by providing oversight of assessments and cleanups in accordance with the California Health and Safety Code, and the CCR. The SAM's VAP also provides staff consultation, project oversight, and technical or environmental report evaluation and concurrence on projects pertaining to properties contaminated with hazardous substances. The DEH SAM Program maintains the SAM list of contaminated sites that have previously or are currently undergoing environmental investigations and/or remedial actions.

The SAM Program covers the entire San Diego region and includes remediation sites of all sizes. The SAM case listing is revised and updated regularly and the number of sites on the list is continually changing but may contain upwards of 5,000 cases at one time. If a project is submitted to the County for discretionary review and is located on a site found on the SAM list, the project status must be determined, and any ongoing remediation requirements coordinated with the DEH SAM project manager (DEH 2018a).

Voluntary Assistance Program

The DEH VAP is a voluntary option for project oversight, staff consultation, and technical report evaluation for projects on properties with hazardous substance contamination. Through the VAP, members of the SAM team at the DEH provide consultation and overview, and report concurrence on projects involving properties suspected or known to be contaminated with hazardous substances. The SAM utilizes current guidelines and policies of the DEH and RWQCB to reach site assessment and cleanup goals at sites under the VAP. Assistance is customized to meet the needs of the applicant. The objective of the VAP is to allow rapid and cost-effective resolution of contamination problems. The most commonly submitted documents are work plans, Phase I ESA reports, Phase II ESA reports, and health risk evaluations (DEH 2018b).

County of San Diego Underground Storage Tank Program

The DEH regulates construction, operation, repair, and removal of UST systems. The program administers and enforces federal and State laws and regulations and local ordinances for the construction/installation, modification, upgrade, and removal of USTs in the San Diego region. If contamination is discovered or likely to be present, owners or operators of USTs are required by law to report the contamination to the DEH HMD and SAM programs and to take corrective action (DEH 2018c).

San Diego County Hazardous Materials Area Plan

The County of San Diego DEH HMD established the San Diego County Hazardous Materials Area Plan based on federal and State requirements for emergency response to a release or threatened release of a hazardous material within the County. The Hazardous Materials Program and Response Plan contained in the Hazardous Materials Area Plan serves the majority of the cities in the San Diego region (County of San Diego 2017b).

Airport and Flight Safety

San Diego County Regional Airport Authority

The San Diego County Regional Airport Authority (Airport Authority) was established under State law as an independent agency to manage the day-to-day operations of San Diego International Airport and to address the

region's long-term air transportation needs (Airport Authority 2021). As the ALUC the Airport Authority is responsible for creating or updating for the region's ALUCPs.

In addition to the public or military airports, there are numerous private airports, airstrips, and helipads in the region. Many of these private airports are located in the eastern areas of the region or remote vacation destinations. Several private helipads are located on the roofs of hospitals and buildings owned by large corporations, or used by police stations. The majority of these private airports have not adopted an ALUCP.

Requirements for Notice to Military

Public Resources Code (PRC) Section 21098 requires lead agencies to submit a notice to the military service that would be affected by a proposed General Plan Amendment; project of statewide, regional, or area-wide significance; or a project that must be referred to the ALUC when the project is located within specific boundaries of a low-level flight path, military impact zone, or special use airspace. Noticing is required when a Notice of Preparation of an EIR is issued and when environmental documents are released for public review. Government Code Section 65352 requires that, prior to action by a legislative body to adopt or substantially amend a general plan, the lead agency shall refer the proposed action to various entities, including the branches of the United States Military that have provided the Office of Planning and Research with a mailing address, when the proposed action is:

- Located within 1,000 feet of a military installation
- Located beneath a low-level flight path
- Within special use airspace as defined in PRC Section 21098 (California Legislative Information 2018)

Disaster Recovery and Assistance/Natural Disasters

County of San Diego Office of Emergency Services and Unified Disaster Council

In the San Diego region, the County OES and the Unified Disaster Council (UDC) play a central role in the preparation and execution of emergency response and evacuation plans. OES alerts and notifies appropriate agencies when disaster strikes, coordinates all responding agencies, ensures resources are available and mobilized, develops plans and procedures for response and recovery, and develops and provides preparedness materials for the public (San Diego County OES 2018a).

The UDC is the governing body of the Unified San Diego County Emergency Services Organization. The UDC is composed of the Chair of the County of San Diego Board of Supervisors, who serves as Chair of the Council, and representatives from the 18 incorporated cities. The primary purpose of the UDC and the OES is to provide for the coordination of plans and programs designed for the protection of life and property in the San Diego region.

The UDC, with OES acting as staff, has prepared and adopted the Unified San Diego County Emergency Services Organization and County of San Diego Operational Area Emergency Operations Plan (Emergency Plan). The Emergency Plan outlines strategies, procedures, recommendations, and organizational structures that can be used to implement a coordinated evacuation effort in the San Diego Operational Area (UDC 2018).

The OES maintains Dam Evacuation Plans for the Operational Area, and other stand-alone plans are available for places and events that might produce the need for evacuations (San Diego County OES 2014). The plans are listed below:

- The San Diego County Nuclear Power Plant Emergency Response Plan
- The San Diego County Operational Area Oil Spill Contingency Element of the Area Hazardous Materials Plan
- The Unified San Diego County Emergency Services Organization Operational Area Energy Shortage Response Plan
- The San Diego Operational Area Recovery Plan
- The San Diego County Multi-Jurisdictional Hazard Mitigation Plan
- The San Diego Urban Area Tactical Interoperable Communications Plan
- The San Diego County Terrorist Incident Emergency Response Protocol

San Diego County Multi-Jurisdictional Hazard Mitigation Plan

The federal Disaster Mitigation Act of 2000 (Public Law 106-390) requires all local governments to create disaster plans in order to qualify for hazard mitigation funding. The Multi-Jurisdictional Hazard Mitigation Plan is a countywide plan that identifies risks and ways to minimize damage by natural and human-made disasters. The plan is a comprehensive resource document that serves many purposes such as enhancing public awareness, creating a decision tool for management, promoting compliance with State and federal program requirements, enhancing local policies for hazard mitigation capability, and providing inter-jurisdictional coordination. The plan evaluates risks associated with coastal storms, erosion, tsunami, dam failure, earthquakes, floods, rain-induced landslides, liquefaction, structure/wildland fires, and manmade hazards. It also provides goals, objectives, and actions to reduce impacts from these hazards. The plan was last revised in 2018 and is currently being reviewed and revised (San Diego County OES 2021).

4.9.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the checklist questions that address the criteria in CEQA Guidelines Appendix G. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR and the unique nature of the proposed Plan.

Checklist questions for hazards and hazardous materials are provided in Section IX of CEQA Guidelines Appendix G. For purposes of this EIR the Appendix G questions have been combined and modified. Specifically, HAZ-1 below incorporates the questions found within Appendix G Section IX(b) and IX(d) regarding emitting hazardous materials and location on a hazardous materials site. HAZ-2 addresses questions IX(a) and IX(c) addressing public hazards through transport, use, and disposal of hazardous materials/hazardous material handling near schools. HAZ-3 addresses air traffic hazards consistent with question IX(e) regarding public airports. The excessive noise portion of question IX(e) is addressed in criterion NOI-3 in Section 4.13, *Noise and Vibration.* HAZ-4, regarding emergency response and evacuation addresses Section IX(f) and Section XVII(d) related to transportation and Section XX (a) related to wildfire addressing emergency response and evacuation. Appendix G, Section IX, question (g) is addressed in criterion WF-4 in Section 4.19, *Wildfire.* For the purpose of this EIR, implementation of the proposed Plan would have a significant hazards impact if it would:

HAZ-1	Create a significant hazard by generating hazardous emissions or handling hazardous materials, or result in the release of hazardous materials into the environment during pre-construction, demolition, and/or construction activities, including being located on a Government Code Section 65952.5 hazardous materials site.
HAZ-2	Create a significant hazard to the public, schools within one-quarter mile, or the environment through the routine use, handling, transport, or disposal of hazardous materials.
HAZ-3	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area.
HAZ-4	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan or result in inadequate emergency access.

4.9.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

HAZ-1 CREATE A SIGNIFICANT HAZARD BY GENERATING HAZARDOUS EMISSIONS OR HANDLING HAZARDOUS MATERIALS, OR RESULT IN THE RELEASE OF HAZARDOUS MATERIALS INTO THE ENVIRONMENT DURING PRE-CONSTRUCTION, DEMOLITION, AND/OR CONSTRUCTION ACTIVITIES, INCLUDING BEING LOCATED ON A GOVERNMENT CODE SECTION 65952.5 HAZARDOUS MATERIALS SITE

ANALYSIS METHODOLOGY

The following analysis describes the types of hazardous materials that would be encountered, used, and handled during the preconstruction, demolition, or construction of development projects associated with the implementation of the proposed Plan. It analyzes whether hazardous materials encountered, used, or handled during such activities would create a significant hazard to people or the environment. The analysis compares the locations of forecasted regional growth and land use change or transportation network improvements and programs to general hazardous materials conditions, including Government Code Section 65952.5 hazardous materials sites, that could be disturbed and/or encountered during these activities. This analysis also identifies applicable laws and regulations for the proper storage, containment, use, and removal of hazardous materials during preconstruction, demolition, and construction; and describes how they minimize hazards and hazardous materials impacts.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, regional population is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). Approximately 79 percent of the forecasted regional population increase by 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent).

Most land uses are likely to involve activities in which some form of hazardous materials would be routinely used, stored, handled, and transported. Increased residential and mixed-use development would increase the use, storage, and disposal of household hazardous materials. The grading, excavation, and dewatering of sites

for new development and redevelopment throughout the region could expose construction workers and the public to known or potentially unknown hazardous substances present in the soil or groundwater. In the event undiscovered hazardous material contamination is found in the soil or groundwater during construction activities for new development and redevelopment, such contamination could cause short- or long-term adverse health effects in persons exposed to the hazardous substances.

In addition, exposure to contaminants could occur from construction-related activities that would disturb existing hazardous waste sites (e.g., demolition, soil disturbances); routine use, disposal, and storage of common hazardous materials such as paints, solvents, and cleaning products; and/or accidents during the routine transport of hazardous materials. These materials would include any regulated asbestos-containing materials, lead-based paint, or debris characterized as hazardous waste (e.g., lead waste) from demolition of facilities constructed prior to 1978.

Construction activities associated with forecasted regional growth and land use change would disturb the subsurface in the area of some former UST sites. Disturbing residual petroleum contamination increases the risks to human health and the environment during excavation, transportation, and disposal. Additionally, construction activities would be located on or near the sites identified in Table 4.9-1 from the DTSC database. In some cases, former uses of land, such as agriculture and industrial processes, have left residual hazardous substance contamination in the soil, which would pose an adverse risk to humans or the environment when encountered during ground disturbance activities such as grading or removal of soil prior to construction.

Wherever hazardous materials are used or stored, or hazardous waste generated, there is the potential for releases to the environment. In each situation, the hazards and the risks they would pose to people or the environment would depend on the nature and amount of the hazardous materials used, the location where the materials would be used and stored and the particular containment measures put into place, the processes and handling procedures for the materials, and the personnel dealing with the hazardous materials. Although such activities involve strict regulations regarding monitoring and handling, accidental release of hazardous materials due to natural disasters, human error, or misuse is possible.

As described in Section 4.9.2, numerous federal, State, and local regulations exist that reduce the potential for humans or the environment to be impacted by generating hazardous emissions or handling of hazardous materials during preconstruction, demolition, and or construction activities. Businesses that handle/generate hazardous materials within the region are monitored by EPA; San Diego Regional Water Quality Control Board (RWQCB); the Department of Toxic Substances Control (DTSC), the County of San Diego DEH; LEA programs; and the SDAPCD. The California Administrative Code provides standards designed to avoid releases, including provisions regarding securing materials and container design. The County of San Diego's DEH is also required to conduct ongoing routine inspections to ensure compliance with existing laws and regulations; to identify safety hazards that could cause or contribute to an accidental spill or release; and to suggest preventative measures to minimize the risk of a spill or release of hazardous substances.

Compliance with such regulations would minimize the potential for creation of a hazard and provide planning mechanisms for prompt and effective cleanup if an accidental release did occur. Adherence to existing regulations would therefore ensure that any emissions or handling of hazardous materials during preconstruction, demolition, and construction of development projects would not create a significant hazard. Therefore, regional growth and land use change would have a less than significant impact.

Transportation Network Improvements and Programs

Major transportation network improvements by 2025 include new Managed Lanes on I-5 from Manchester Avenue to Vandegrift; new toll lanes on SR 11 to the Otay Mesa POE; Interchange and Arterial Operational improvements at SR 94 and SR 125, and the Otay Mesa Port of Entry Commercial Vehicle Enforcement Facility (CVEG); and tolling equipment and Regional Border Management System investments on SR 11. Other major network improvements include double- tracking at certain locations on the LOSSAN rail corridor along with a station addition in the Gaslamp Quarter, San Diego.

These transportation network improvements would involve the routine transport, use, or disposal of hazardous materials, particularly for highway, light rail, and arterial improvement projects. During construction activities, hazardous waste sites could be encountered (particularly those projects through urban infill areas and older structures that may contain hazardous materials), which may require the extraction and transportation of contaminated soil, groundwater, and hazardous building materials. In addition to hazardous waste that may be encountered at sites with historical chemical releases, along well-traveled transportation road corridors that existed prior to the phasing out of leaded gasoline, including the routes listed above, shallow soil adjacent to the right-of-way may have been contaminated with aerially-deposited lead (ADL) caused by historical emissions from vehicle exhausts. The lead concentrations in shallow soil may exceed State and Federal hazardous waste criteria or may be at concentrations that require special handling and waste management.

The construction and maintenance of transportation facilities would likely involve the use of hazardous materials such as fuels and other refined petroleum products, solvents, and paints and other architectural coatings. Highway improvements would increase the capacity of existing roadways, indirectly increasing the capacity of routes used to transport hazardous materials. Improvements to rail corridors would increase the capacity of goods, including hazardous materials, to be carried by freight rail throughout the region. Such improvements would increase the risk of accidents and the potential release of hazardous materials into the environment.

Existing federal, State, and local laws, regulations, and programs included in Section 4.9.2 that govern the use of hazard materials strictly regulate the proper handling of such materials and their containers to ensure that routine transport, use, and disposal of hazardous materials do not create a significant hazard to the public or the environment. Adherence to these regulations would ensure impacts associated with routine transport, use, or disposal of hazardous materials would be less than significant.

2025 Conclusion

Regional growth, land use development, and transportation network improvements would increase by 2025, thereby increasing the risk of hazards to the public and/or the environment through the routine transport, use, or disposal of hazardous materials during preconstruction, construction, and demolition activities. However, adherence to existing regulations, as discussed above, would ensure that that these activities do not create a significant hazard to people or the environment. Therefore, this impact (HAZ-1) is less than significant for this period.

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional population is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent).

As described in the 2025 analysis, because most land uses are likely to involve activities in which some form of hazardous materials would be routinely used, stored, handled, and transported, this growth has the potential to increase the chance of an accidental release of these materials. In addition, construction and demolition activities would increase, which would involve a variety of products that include hazardous materials. In some cases, former uses of the land, such as agriculture and industrial processes and sites with a history of chemical releases (major sites were identified in Table 4.9-1), may leave residual hazardous substances in soil and groundwater, which could pose a significant risk to people or the environment. Similar conditions can result from demolition and construction near former UST sites and near structures (e.g., older bridges) that used building materials now considered hazardous (e.g., asbestos and lead-based paint). By 2035, the storage, use, or generation of hazardous materials or hazardous waste would be greater, increasing the potential for releases to the environment.

As described in Section 4.9.2, numerous federal, State, and local regulations exist that reduce the potential for people or the environment to be impacted by an accidental release of hazardous materials. Compliance with such regulations would minimize the potential for a release to occur and provide planning mechanisms for prompt and effective cleanup if an accidental release did occur. Adherence to existing regulations would ensure impacts related to the accidental release of hazardous materials into the environment during construction and demolition activities would be less than significant.

Transportation Network Improvements and Programs

The transportation network improvements that would be implemented between 2026 and 2035 include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, SR 125, I-5, I-8, I-15, I-805. Double-tracking of the LOSSAN rail corridor would continue between 2026 and 2035. This phase also includes a major new commuter rail line (Route 582) between National City and Sorrento Mesa. It also includes light rail investments with SPRINTER, Blue Line, and Orange Line double tracking and grade separations. During this period, two intermodal transit center Mobility Hub projects would be constructed: the Central Mobility Hub (CMH) in downtown San Diego and the San Ysidro Mobility Hub (SYMH) at the US-Mexico border.

The construction of regional transportation improvements would employ materials such as oils, greases, and solvents that could be released into the environment accidentally if not transported, handled, used, or disposed of properly. During construction activities, hazardous waste sites could be encountered and materials released into the environment. Most of the proposed highway and freeway improvements would increase the capacity of existing roadways, which would facilitate the movement of goods, including hazardous materials, throughout the San Diego region, thus increasing the risk of accidents and the release of hazardous materials into the environment. As discussed in the 2025 analysis, construction along highway corridors that existed prior to the phasing out of leaded-gasoline, ADL impacted soil would be encountered that may require special handling, management, and disposal.

The federal, State, and local laws, regulations, and programs discussed in Section 4.9.2 reduce the potential for people or the environment to be impacted by an accidental release of hazardous materials. Adherence to these laws, regulations, and programs would ensure that impacts associated with routine transport, use, or disposal of hazardous materials would be less than significant.

2035 Conclusion

Regional growth, land use development, and transportation network improvements would increase by 2035, thereby increasing the risk of hazards to the public and/or the environment through the routine transport, use, or disposal of hazardous materials during preconstruction, construction, and demolition activities. However, adherence to existing regulations would ensure that a significant hazard to the public or the environment would not be created due to upset or accident conditions involving the release of hazardous materials into the environment. Therefore, this impact (HAZ-1) is less than significant for this period.

2050

Regional Growth and Land Use Change

From 2036 to 2050, regional population is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent) and 164,843 jobs (8 percent). Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), City of San Marcos (13 percent), and City of Chula Vista (28 percent).

As described in the 2025 and 2035 analyses, as development and redevelopment increase so does the routine transport, use, or disposal of hazardous materials. The severity of potential effects varies with the activity conducted, the concentration of and type of hazardous material or wastes present, and the proximity of sensitive receptors. Additionally, construction activities would be located on or near the sites identified in Table 4.9-1 from the DTSC database. In some cases, former uses of the land, such as agriculture and industrial processes, may leave residual hazardous substances co in the soil and groundwater, which could pose a significant risk to people or the environment. By 2050, the storage, use, or generation of hazardous materials or hazardous waste would be greater, increasing the potential for releases to the environment.

Federal, State, and local laws, regulations, and programs described in Section 4.9.2 that govern the use of hazard materials strictly regulate the proper handling of such materials and their containers to ensure that routine transport, use, and disposal of hazardous materials do not create a significant hazard to the public or the environment. Adherence to these laws, regulations, and programs would ensure that impacts associated with routine transport, use, or disposal of hazardous materials would be less than significant.

Transportation Network Improvements and Programs

Major transportation network improvements include new Managed Lanes and Managed Lane Connectors on State Routes 52, 56, 54, 125, 905 and Interstates 5, 8, 15, 805. Double- tracking at certain locations on the LOSSAN rail corridor would continue during this period. Three major new commuter rail lines would be constructed, including routes between Downtown San Diego and El Cajon (Route 581); National City to the U.S. Border (Route 582 [Extension]) and Central Mobility to the U.S. Border (Route 583). It also includes double tracking of the SPRINTER, Green Line, and Orange Line. Double tracking and grade separations on the Blue Line also are included.

Similar to the 2025 and 2035 analyses, the types of activities that would involve the routine transport, use, or disposal of hazardous materials would continue to occur into 2050 as additional transportation network improvements are implemented. The highway improvements to be implemented by 2050 involve an increase in the capacity of existing roadways, indirectly increasing the capacity of routes used to transport hazardous materials. By 2050, the expansion of rail lines discussed in Chapter 2, *Project Description,* would necessitate the use and transport of hazardous materials for construction purposes. As discussed in the 2025 and 2035 analysis, construction along highway corridors that existed prior to the phasing out of leaded-gasoline, ADL impacted soil would be encountered that may require special handling, management, and disposal.

The federal, State, and local laws, regulations, and programs described in Section 4.9.2 that govern the use of hazard materials strictly regulate the proper handling of such materials and their containers to ensure that routine transport, use, and disposal of hazardous materials do not create a significant hazard to the public or the environment. Adherence to these laws, regulations, and programs would ensure that impacts associated with routine transport, use, or disposal of hazardous materials would be less than significant.

2050 Conclusion

Regional growth, land use development, and transportation network improvements would increase by 2050, thereby increasing the risk of hazards to the public and/or the environment through the routine transport, use, or disposal of hazardous materials during preconstruction, construction, and demolition activities. However, adherence to the existing regulations discussed above would ensure that a significant hazard to the public or the environment would not be created due to upset or accident conditions involving the release of hazardous materials into the environment. Therefore, this impact (HAZ-1) is less than significant for this period.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan could exacerbate climate change effects on release of hazardous materials to the surrounding environment. Climate change is expected to result in increased frequency and intensity of flooding in the future. This could result in hazardous materials being added to runoff if hazardous materials are improperly stored or exposed to heavy rainfall. Climate change is also expected to increase wildfire risk; this could result in increased hazardous pollutant air emissions if materials are improperly stored or exposed to wildfire. The proposed Plan would result in increased development, which would increase impervious surfaces and thus worsen flooding impacts. Increased development, particularly if constructed near high wildfire risk zones, would also increase the risk of human ignition and thus increase wildfire risk. Therefore, the proposed Plan could exacerbate climate change effects on release of hazardous materials.

HAZ-2 CREATE A SIGNIFICANT HAZARD TO THE PUBLIC, SCHOOLS WITHIN ONE-QUARTER MILE, OR THE ENVIRONMENT THROUGH THE ROUTINE USE, HANDLING, TRANSPORT, OR DISPOSAL OF HAZARDOUS MATERIALS.

ANALYSIS METHODOLOGY

This section analyzes impacts associated with the routine use, handling, transport, and disposal of hazardous materials. It also identifies standard practices for the proper storage, containment, use, and removal of hazardous materials during operations of development projects associated with implementation of the proposed Plan.

The handling and emission of hazardous materials within one-quarter mile of an existing or proposed school is also addressed. The possibility for new schools to be sited near locations where hazardous materials may be handled and emitted is discussed in relation to the locations of proposed development and redevelopment. In addition, the analysis considers how construction activities associated with development projects and transportation network improvements may result in the transport and release of hazardous materials within one-quarter mile of an existing or proposed school. This section also analyzes how existing regulations minimize impacts associated with the routine use, handling, transport, and disposal of hazardous materials.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, regional population is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). Approximately 79 percent of the forecasted regional population increase by 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent).

Given the large number of existing schools located throughout the San Diego region (approximately 1,025 public and private), it is likely that additional development and redevelopment forecasted would occur within one-quarter mile of an existing school. Also, it is possible that new or proposed schools could be sited near locations where hazardous materials, substances, and/or waste may be handled or emitted. With the forecasted increase in population and development, there is an increased risk of hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

However, as stated in Section 4.9.2, the current regulatory environment provides a high level of protection, which is monitored and enforced at the federal, State, and local levels. The California Education Code (Section 17210 et seq.) outlines the requirements of siting school facilities near or on known or suspected hazardous materials sites; or near facilities that emit hazardous air emissions; or handle hazardous or acutely hazardous materials, substances, or waste. The code requires that, prior to commencing the acquisition of property for a new school site, an environmental site investigation be completed to determine the health and safety risks (if any) associated with a site. Furthermore, permitting requirements for individual hazardous materials handlers or emitters, including enforcement of PRC Section 21151.4, would require evaluation and notification where potential materials handling and emissions could occur within one-quarter-mile of schools (existing or proposed). In addition, local regulatory agencies (e.g., fire departments, DEH) have developed emergency response programs designed to limit exposure of schools and other sensitive receptors to hazardous materials and wastes. Therefore, adherence to existing regulations would ensure that the risk of hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school would be minimized. Therefore, this impact (HAZ-2) is less than significant for this period.

Transportation Network Improvements and Programs

Major transportation network improvements by 2025 include new Managed Lanes on I-5 from Manchester Avenue to Vandegrift; new toll lanes on SR 11 to the Otay Mesa POE; Interchange and Arterial Operational improvements at SR 94 and SR 125, and the Otay Mesa Port of Entry Commercial Vehicle Enforcement Facility

(CVEG); and tolling equipment and Regional Border Management System investments on SR 11. Other major network improvements include double- tracking at certain locations on the LOSSAN rail corridor along with a station addition in the Gaslamp Quarter, San Diego.

Construction activities associated with planned transportation network improvements may result in hazardous emissions or the handling of hazardous or acutely hazardous materials, particularly those activities that may involve the use of equipment that contains hazardous materials (e.g., diesel- fueled equipment), or the transportation of excavated soil and/or groundwater containing contaminants from areas that are identified as being contaminated. In addition, hazardous materials carried on the existing highways, freight rail, and arterials could affect schools via exposure of sensitive receptors to health hazards if there were to be a release or incident during transportation.

Using SANDAG's geographic information system (GIS) database for schools located within the San Diego region, the transportation network improvements by 2025 were overlain on the region to identify where impacts on existing schools may occur if hazardous materials were to be accidentally released into the environment. The results of this analysis indicate that there are approximately 167 schools located within one-quarter mile of planned transportation network improvements. These schools may be impacted if hazardous materials carried on roadways or rail lines were to be released during transportation. In addition, construction of the transportation network improvements would result in the generation of certain types of emissions (e.g., petroleum hydrocarbons, fugitive dust) or the handling of hazardous substances or waste within one-quarter mile of an existing or proposed school site.

As discussed above, the federal, State, and local laws, regulations, and programs described in Section 4.9.2 reduce the risk of hazardous emissions or the handling of hazardous materials, substances, or waste near schools. Therefore, adherence to these regulations would ensure that the risk of hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school would be minimized. Therefore, this impact is less than significant.

2025 Conclusion

Regional growth, land use development, and transportation network improvements would increase by 2025, thereby increasing the risk related to the handling and emission to hazardous materials near schools. However, adherence to existing regulations would ensure that risks associated with the handling or emissions of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school would be minimized. Therefore, this impact (HAZ-2) is less than significant for this period.

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional population is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent) and 159,728 jobs (9 percent). Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent).

The forecasted regional growth and land use development would increase the types and amounts of hazardous materials throughout the San Diego region relative to existing conditions and those experienced by 2025. By 2035, allowable land uses would also likely result in siting sensitive land uses, including schools, near facilities

that use hazardous materials. As a result, hazardous emissions or the handling of hazardous or acutely hazardous materials within one-quarter mile of schools or other sensitive receptors would occur.

However, as stated in Section 4.9.2, the current regulatory environment provides a high level of protection, which is monitored and enforced at the federal, State, and local levels. The California Education Code (Section 17210 et seq.) outlines the requirements of siting school facilities near or on known or suspected hazardous materials sites; or near facilities that emit hazardous air emissions; or handle hazardous or acutely hazardous materials, substances, or waste. Therefore, adherence to these regulations would ensure that impacts associated with the handling or emissions of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school would be less than significant.

Transportation Network Improvements and Programs

The transportation network improvements that would be implemented between 2026 and 2035 include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, SR 125, I-5, I-8, I-15, I-805. Double-tracking of the LOSSAN rail corridor would continue between 2026 and 2035. This phase also includes a major new commuter rail line (Route 582) between National City and Sorrento Mesa. It also includes light rail investments with SPRINTER, Blue Line, and Orange Line double tracking and grade separations. During this period, two intermodal transit center Mobility Hub projects would be constructed: the Central Mobility Hub (CMH) in downtown San Diego and the San Ysidro Mobility Hub (SYMH) at the US-Mexico border.

Construction activities associated with the planned transportation network improvements by 2035 may result in hazardous emissions or the handling of hazardous or acutely hazardous materials, or the transportation of excavated soil and/or groundwater containing contaminants near schools. Using SANDAG's GIS database for schools located within the San Diego region, the transportation network improvements planned by 2035 were overlain on the region to identify where impacts on existing schools may occur if hazardous materials were to be accidentally released into the environment. The results of this analysis indicate that there would be approximately 194 schools located within one-quarter mile of planned transportation network improvements by 2035. These schools may be impacted if hazardous materials carried on roadways or rail lines were to be released during transportation. In addition, hazardous materials carried on the existing highways and arterials could affect these schools via exposure of sensitive receptors to health hazards if there were to be a release or incident during transportation.

However, as discussed above, existing federal, State, and local laws, regulations, and programs described in Section 4.9.2 reduce the risk of hazardous emissions or the handling of hazardous materials, substances, or waste near schools. Therefore, adherence to existing regulations would ensure that the risk of hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school would be minimized. Therefore, this impact is less than significant.

2035 Conclusion

Regional growth, land use development, and transportation network improvements would increase by 2035, thereby increasing the risk related to the handling and emission of hazardous materials near schools. However, adherence to existing regulations would ensure that risks associated with the handling or emissions of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school would be minimized. Therefore, this impact (HAZ-2) is less than significant for this period.

2050

Regional Growth and Land Use Change

From 2036 to 2050, regional population is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent). Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), City of San Marcos (13 percent), and City of Chula Vista (28 percent).

The forecasted regional growth and land use development would increase the types and amounts of hazardous materials throughout the San Diego region relative to existing conditions and those experienced in 2025 and 2035. Allowable land uses planned by 2050 would also likely result in siting sensitive land uses, including schools, near facilities that use hazardous materials. As a result, hazardous emissions or the handling of hazardous or acutely hazardous materials within one-quarter mile of schools or other sensitive receptors would occur.

However, as stated in Section 4.9.2, the current regulatory environment provides a high level of protection, which is monitored and enforced at the federal, State, and local levels. The California Education Code (Section 17210 et seq.) outlines the requirements of siting school facilities near or on known or suspected hazardous materials sites, or near facilities that emit hazardous air emissions, or handle hazardous or acutely hazardous materials, substances, or waste. Therefore, adherence to these regulations would ensure impacts associated with the handling or emissions of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school would be less than significant.

Transportation Network Improvements and Programs

Major transportation network improvements include new Managed Lanes and Managed Lane Connectors on State Routes 52, 56, 54, 125, 905 and Interstates 5, 8, 15, 805. Double-tracking at certain locations on the LOSSAN rail corridor would continue during this period. Three major new commuter rail lines would be constructed, including routes between Downtown San Diego and El Cajon (Route 581); National City to the U.S. Border (Route 582 [Extension]) and Central Mobility to the U.S. Border (Route 583). It also includes double tracking of the SPRINTER, Green Line, and Orange Line. Double tracking and grade separations on the Blue Line also are included.

Construction activities associated with these transportation network improvements may result in hazardous emissions or the handling of hazardous or acutely hazardous materials, or the transportation of excavated soil and/or groundwater containing contaminants near schools. Using SANDAG's GIS database for schools located within the San Diego region, the transportation network improvements planned by 2050 were overlain on the region to identify where impacts on existing schools may occur if hazardous materials were to be accidentally released into the environment. The results of this analysis indicate that there would be approximately 190 schools located within one-quarter mile of planned transportation network improvements by 2050. In addition, hazardous materials carried on the existing highways and arterials could affect these schools via exposure of sensitive receptors to health hazards if there were to be a release or incident during transportation.

However, as discussed above, existing federal, State, and local laws, regulations, and programs described in Section 4.9.2 reduce the risk of hazardous emissions or the handling of hazardous near schools. Therefore, adherence to these laws, regulations, and programs would ensure impacts would be less than significant.

2050 Conclusion

Regional growth, land use development, and transportation network improvements would increase by 2050, thereby increasing the risk related to the handling and emission to hazardous materials near schools. However, adherence to existing regulations, as discussed above, would ensure that the risks associated with the handling or emissions of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school would be minimized. Therefore, this impact (HAZ-2) is less than significant for this period.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan could potentially exacerbate climate change effects of creating hazards to schools through routine use, handling, transport, or disposal of hazardous materials. Climate change is expected to result in increased frequency and intensity of flooding in the future. This could increase hazardous materials in runoff if hazardous materials are improperly stored or exposed to heavy rainfall. Climate change is also expected to increase wildfire risk; this could increase hazardous pollutant air emissions if materials are improperly stored or exposed to wildfire. The proposed Plan would result in increased development, which would increase impervious surfaces and thus worsen flooding impacts. Increased development, particularly if constructed near high wildfire risk zones, would also increase the risk of human ignition and thus increase wildfire risk. Therefore, the proposed Plan could exacerbate climate change effects on creating hazards to schools through routine use, handling, transport, or disposal of hazardous materials.

HAZ-3 FOR A PROJECT LOCATED WITHIN AN AIRPORT LAND USE PLAN OR, WHERE SUCH A PLAN HAS NOT BEEN ADOPTED, WITHIN TWO MILES OF A PUBLIC AIRPORT OR PUBLIC USE AIRPORT, RESULT IN A SAFETY HAZARD FOR PEOPLE RESIDING OR WORKING IN THE PROJECT AREA.

ANALYSIS METHODOLOGY

This section identifies whether implementation of the proposed Plan's growth and land use changes would result in development projects that would cause safety hazards. To perform this evaluation, the locations of forecasted growth and land use changes are compared to the locations of AIAs and safety zones. The ability of ALUCPs to minimize such safety hazards is described.

Transportation network improvements, including height and location of associated structures, would be evaluated on a project-specific basis for compliance with FAA requirements, so that transportation network improvements would not result in air traffic hazards and would be in compliance with any applicable, current ALUCPs and any additional regulatory document, for each period of evaluation (2025, 2035, and 2050); therefore, they will not be addressed further in this analysis.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, regional population is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). Approximately 79 percent of the forecasted regional

population increase by 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent).As indicated in Section 4.9.1, *Existing Conditions,* there are 16 public-use and military airports in the San Diego region. The future development of land uses in areas subject to off-airport air crash hazards could substantially increase the risk of loss of lives and property if those uses are incompatible with safe aircraft navigation. While the proposed Plan includes the Trolley extension to the San Diego International Airport, it does not propose any land use changes or incompatible land uses within the vicinity of public airports. Nonetheless, it is possible that if an aircraft-related accident occurred, a safety hazard could be presented to individuals on the ground within the area. Regional growth in areas located close to other public or military airports or in flight paths could expose people or structures to aircraft accidents.

To prevent incompatible uses in areas of higher aircraft hazard potential, the ALUC has adopted ALUCPs with land use policies and criteria in the interest of public safety. While the ALUCPs cannot prevent aircraft accidents from occurring, they do contain policies and criteria to limit future incompatible uses and emergency response and evacuation plans to minimize safety impacts. As described in Sections 4.9.1 and 4.9.2, the Airport Authority, which is the ALUC for the San Diego region, is required to assist local agencies in ensuring compatible land uses in the vicinity of existing or proposed airports; to coordinate planning at State, regional, and local levels; to prepare and adopt an airport land use plan as required by PRC Section 21675; to review plans or regulations submitted by local agencies; and to review and make recommendations regarding the land uses, building heights, and other issues relating to air navigation safety and promotion of air commerce.

Safety compatibility zones identify areas where distinct levels of risk exist, which ALUCPs use to differentiate allowed and prohibited land uses. The shapes and sizes of the zones are largely based on accident data and other analyses prepared by the FAA. Data have shown that a higher percentage of crashes occur at each end of a runway, with a lower percentage occurring along the length of a runway. As a result, ALUCPs typically restrict land uses to a greater degree at each end of a runway (FAA 2018).

The Department of Defense requires military airfields to adopt AICUZ studies, which assess compatible land uses in the vicinity of a military air station in a way equivalent to ALUCPs. PRC Section 21098 would reduce hazards associated with development near military airports by requiring lead agencies to submit a notice to the military service that would be affected by a proposed General Plan Amendment or significant project located within specific boundaries of a low-level flight path, military impact zone, or special use airspace.

Additionally, development projects would be subject to FAA evaluation. The FAA evaluates proposed development projects for obstruction hazards and potential hazards to air safety. Obstruction standards are regulated by height and whether a proposal is distractive and/or hazardous to a pilot. FAA evaluation would occur where the project proposes certain components that trigger FAA notification, including projects located within a 2-mile radius around public-use airports that exceed a specified height, that could create electronic or visual hazards, or that could increase the attraction of wildlife around airports. There are no specific FAA standards for visual or electronic hazards, and potential hazards are evaluated by the FAA on a case-by-case basis.

Existing regulations, FAA procedures, ALUCPs, and AICUZ studies ensure compatibility between uses and reduce the potential for aircraft accidents. Therefore, adherence to the regulations above would ensure hazards associated with airports or air traffic would be less than significant.

2025 Conclusion

By 2025, increased development would occur near public or military airports. Adherence to the regulations described in Section 4.9.2 would minimize safety hazards associated with airports. Therefore, this impact (HAZ-3) is less than significant for this period.

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional population is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent).

As described in the 2025 analysis, a portion of this growth would occur near public-use or military airports, particularly those located near existing urban development. It is possible that if an aircraft-related accident occurred, a safety hazard could be presented to individuals on the ground within the area. Regional growth in areas located close to other public or military airports or in flight paths could expose people or structures to aircraft accidents. The future development of land uses in areas subject to off-airport air crash hazards could substantially increase the risk of loss of lives and property if those uses are incompatible with safe aircraft navigation. However, existing regulations, FAA procedures, ALUCPs, and AICUZ studies ensure compatibility between land uses and airports and reduce the potential for aircraft accidents. Therefore, adherence to these regulations and programs would ensure hazards associated with airports or air traffic would be less than significant.

2035 Conclusion

By 2035, increased development would occur near public or military airports. Adherence to the regulations described in Section 4.9.2 would minimize safety hazards associated with airports. Therefore, this impact (HAZ-3) is less than significant for this period.

2050

Regional Growth and Land Use Change

From 2036 to 2050, regional population is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent).

Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), City of San Marcos (13 percent), and City of Chula Vista (28 percent).

As described in the 2025 and 2035 analyses, a portion of this growth would occur near public-use or military airports, particularly those located near existing urban development. The future development of land uses in areas subject to off-airport air crash hazards could substantially increase the risk of loss of lives and property if those uses are incompatible with safe aircraft navigation. However, existing regulations, FAA procedures, ALUCPs, and AICUZ studies ensure compatibility between land uses and airports and reduce the potential for aircraft accidents. Therefore, adherence to these regulations and programs would ensure hazards associated with airports or air traffic would be less than significant.

2050 Conclusion

By 2050, increased development would occur near public or military airports. Adherence to the regulations described in Section 4.9.2 would minimize safety hazards associated with airports. Therefore, this impact (HAZ-3) is less than significant for this period.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects on safety hazards related to public use airports.

HAZ-4 IMPAIR IMPLEMENTATION OF OR PHYSICALLY INTERFERE WITH AN ADOPTED EMERGENCY RESPONSE PLAN OR EMERGENCY EVACUATION PLAN OR RESULT IN INADEQUATE EMERGENCY ACCESS.

ANALYSIS METHODOLOGY

Emergencies that may require evacuation of populated areas include earthquakes, tsunamis, floods, rain-induced landslides, dam failure, wildland fires, hazardous materials incidents, nuclear materials release, and terrorism. The San Diego County Multi-Jurisdictional Hazard Mitigation Plan, the safety elements in local jurisdictions' general plans, as well as Caltrans maps of state routes have been reviewed to determine whether emergency evacuation route designations exist in any of the proposed regional growth and land use changes or transportation network improvements project areas. These routes were evaluated to determine if their effectiveness for emergency evacuation would be affected by the proposed Plan, either in the long term, or in the short term during construction. Impacts on more routine emergency access to properties by law enforcement or fire protection personnel are also addressed.

This section describes existing response plans and the risk of interference with response plans (for example, if multiple development projects are built at the same time). Established evacuation routes are described, and the role of project-level review is discussed. Transportation network improvements and programs affecting identified emergency response plans, emergency evacuation routes, or emergency access are described and evaluated.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, regional population is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent) and 115,328 jobs (7 percent). Approximately 79 percent of the forecasted regional population increase by 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent).

While implementation of the proposed Plan does not directly involve changes to any of the policies or requirements within any of the established emergency plans, it is possible that land uses and development activities implemented by 2025 would have the potential to interfere with emergency plans and procedures if authorities are not properly notified, or multiple projects are constructed simultaneously and multiple

roadways used for emergency routes are concurrently blocked. However, the proposed Plan also encourages more compact development, specifically within Smart Growth Opportunity Areas. Compact land uses are generally more efficient for emergency service responders since urban areas tend to be well served with these facilities and also because the more compact land use pattern better facilitates access to specific sites. As such, emergency response times may improve in the long run.

Emergency plans and programs are in place on countywide, individual jurisdiction, and special district levels that contain measures to reduce impacts associated with conflicts with emergency response and evacuation plans (refer to Section 4.9.2). As required by the individual implementing agency in coordination with the OES, emergency plans and programs are revisited for updates as frequently as every year, as is the case for the San Diego County Multi-Jurisdictional Hazard Mitigation Plan, to adequately plan for growth within the region. This would include the evaluation of established evacuation routes, as described in San Diego County Multi-Jurisdictional Hazard Mitigation Plan. In addition, discretionary projects would require project-level review pursuant to CEQA to ensure that individual projects do not adversely impact emergency response or evacuation plans. If impacts are determined to be significant at the project level, appropriate mitigation, such as requiring development to provide multiple ingress/egress routes in conformance with State law and local regulations or the identification of alternative traffic routes with appropriate signage, would be required. Therefore, measures are in place to ensure development projects would not impair implementation of or physically interfere with an emergency response or evacuation plan, and this impact is less than significant.

Transportation Network Improvements and Programs

Major transportation network improvements by 2025 include new Managed Lanes on I-5 from Manchester Avenue to Vandegrift; new toll lanes on SR 11 to the Otay Mesa POE; Interchange and Arterial Operational improvements at SR 94 and SR 125, and the Otay Mesa Port of Entry Commercial Vehicle Enforcement Facility (CVEG); and tolling equipment and Regional Border Management System investments on SR 11. Other major network improvements include double-tracking at certain locations on the LOSSAN rail corridor along with a station addition in the Gaslamp Quarter, San Diego.

In general, implementation of the transportation network improvements in and of themselves would not impair or physically interfere with the implementation of any adopted emergency response plan or emergency evacuation plan. By 2025, improvements are planned for the majority of highways identified as evacuation routes in the Emergency Plan discussed above. In addition, expansion of rail lines and other transit improvements may also cause traffic congestion during construction activities, which would temporarily hinder emergency vehicle response or evacuation in the event of an emergency. Particularly in denser urban areas such as downtown, expansion of transit and rail lanes could increase gate down times, thus potentially delaying response time as well.

Under Year 2025 conditions the proposed Plan would improve vehicular delay and congestion within the San Diego region. Additionally, California State law requires drivers to yield the right-of-way to emergency vehicles and also permits emergency vehicles to use opposing lane of travel, the center turn lanes, managed lanes or transit-only lanes. Emergency vehicles can also encroach into on-street bicycle facilities such as Class II Buffered Bike Lanes and Class IV Cycle Tracks to maneuver around pinch points and bottle necks within the roadway. Therefore, in some instances, roadway reconfigurations proposed within the proposed Plan could improve emergency access. For example, a roadway reconfiguration could improve emergency access where a managed lane, transit only lane, or a contiguous center left-turn lane is introduced where it did not previously exist. Generally, multi-lane roadways allow the emergency vehicles to travel at higher speeds and permit other traffic to maneuver out of the path of the emergency vehicle. The proposed Plan also includes Smart System

Platforms that would allow for an integration of infrastructure and services into a system that manages multiple modes of transportation would make it possible for traffic to be managed in real time; for first responders to quickly respond to incidents; and for police, fire, and other authorities to effectively coordinate emergency evacuations.

In addition, as described above and in Section 4.9.2, emergency plans and programs are in place on countywide, individual jurisdiction, and special district levels that contain measures to reduce impacts associated with conflicts with emergency response and evacuation plans. In addition, discretionary projects would require project-level review pursuant to CEQA to ensure that individual projects do not adversely impact emergency response or evacuation plans. Therefore, measures are in place to ensure transportation network improvement projects would not impair implementation of or physically interfere with an emergency response or evacuation plan. This impact is less than significant.

2025 Conclusion

By 2025, increased development and transportation network improvements may cause obstruction for emergency response vehicles or result in activities that would cause physical interference in the implementation of an emergency response or evacuation plan. However, adherence to the regulations described in Section 4.9.2 would ensure development and transportation projects would not impair implementation of or physically interfere with an emergency response or evacuation plan. Therefore, this impact (HAZ-4) is less than significant for this period.

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional population is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent).

As described in the 2025 analysis, while land uses and development activities implemented by 2035 would have the potential to interfere with emergency plans and procedures, in general, emergency response times may improve because of more compact development, particularly within Smart Growth Opportunity Areas. In addition, as described in Section 4.9.2, emergency plans and response programs are in place at the countywide, individual jurisdiction, and special district levels that contain measures to reduce impacts associated with conflicts with emergency response and evacuation plans. In addition, discretionary projects would require project-level review pursuant to CEQA to ensure that individual projects do not adversely impact emergency response or evacuation plans. Therefore, measures are in place to ensure development projects would not impair implementation of or physically interfere with an emergency response or evacuation plan. This impact is less than significant.

Transportation Network Improvements and Programs

The transportation network improvements that would be implemented between 2026 and 2035 include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, SR 125, I-5, I-8, I-15, I-805. Double-tracking of the LOSSAN rail corridor would continue between 2026 and 2035. The 2035 phase also includes a major new commuter rail line (Route 582) between National City and Sorrento Mesa and light rail investments with SPRINTER, Blue Line, and Orange Line double tracking and grade separations. During this

period, two intermodal transit center Mobility Hub projects would be constructed: the Central Mobility Hub (CMH) in downtown San Diego and the San Ysidro Mobility Hub (SYMH) at the US-Mexico border. There would also be five additional improvements to local arterial streets.

As described in the 2025 analysis, implementation of the transportation network improvements in and of themselves would not impair or physically interfere with the implementation of any adopted emergency response plan or emergency evacuation plan. Any interference with emergency responders would likely occur as a result of improvements to the regional and local street network and from possible delays associated with increased gate down times in denser areas. However, emergency plans and response programs are in place at the countywide, individual jurisdiction, and special district levels that contain measures to reduce impacts associated with conflicts with emergency response and evacuation plans (Section 4.9.2). These plans are periodically evaluated by the implementing agencies in coordination with the OES. In addition, discretionary projects would require project-level review pursuant to CEQA to ensure that individual projects do not adversely impact emergency response or evacuation plans. Therefore, measures are in place to ensure transportation network improvement projects would not impair implementation of or physically interfere with an emergency response or evacuation plan. This impact is less than significant.

2035 Conclusion

By 2035, increased development and transportation network improvements may cause obstruction for emergency response vehicles or result in activities that would cause physical interference in the implementation of an emergency response or evacuation plan. However, adherence to the regulations described in Section 4.9.2 would ensure development and transportation projects would not impair implementation of or physically interfere with an emergency response or evacuation plan. Therefore, this impact (HAZ-4) is less than significant for this period.

2050

Regional Growth and Land Use Change

From 2036 to 2050, regional population is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent) and 164,843 jobs (8 percent). Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), City of San Marcos (13 percent), and City of Chula Vista (28 percent).

As described in the 2025 and 2035 analyses, while land uses and development activities implemented by 2050 would have the potential to interfere with emergency plans and procedures, in general, emergency response times may improve because of more compact development, particularly within Smart Growth Opportunity Areas. In addition, emergency plans and response programs are in place at the countywide, individual jurisdiction, and special district level that contain measures to reduce impacts associated with conflicts with emergency response and evacuation plans (Section 4.9.2). In addition, discretionary projects would require project-level review pursuant to CEQA to ensure that individual projects do not adversely impact emergency response or evacuation plans. Therefore, measures are in place to ensure development projects would not impair implementation of or physically interfere with an emergency response or evacuation plan. This impact is less than significant.

Transportation Network Improvements and Programs

Major transportation network improvements include new Managed Lanes and Managed Lane Connectors on State Routes 52, 56, 54, 125, 905 and Interstates 5, 8, 15, 805. Double- tracking at certain locations on the LOSSAN rail corridor would continue during this period. Three major new commuter rail lines would be constructed, including routes between Downtown San Diego and El Cajon (Route 581); National City to the U.S. Border (Route 582 [Extension]) and Central Mobility to the U.S. Border (Route 583). It also includes double tracking of the SPRINTER, Green Line, and Orange Line. Double tracking and grade separations on the Blue Line also are included.

As discussed in the 2025 and 2035 analysis, implementation of the transportation network improvements in and of themselves would not impair or physically interfere with the implementation of any adopted emergency response plan or emergency evacuation plan. Any interference with emergency responders would likely occur as a result of improvements to the regional and local street network and from possible delays associated with increased gate down times in denser areas. However, emergency plans and response programs are in place at the countywide, individual jurisdiction, and special district level that contain measures to reduce impacts associated with conflicts with emergency response and evacuation plans (Section 4.9.2). These plans are periodically evaluated by the implementing agencies in coordination with the OES. In addition, discretionary projects would require project-level review pursuant to CEQA to ensure that individual projects do not adversely impact emergency response or evacuation plans. Therefore, measures are in place to ensure transportation network improvement projects would not impair implementation of or physically interfere with an emergency response or evacuation plan. This impact is less than significant.

2050 Conclusion

By 2050, increased development and transportation network improvements may cause obstruction for emergency response vehicles or result in activities that would cause physical interference in the implementation of an emergency response or evacuation plan. However, adherence to the regulations described in Section 4.9.2 would ensure development and transportation projects would not impair implementation of or physically interfere with an emergency response or evacuation plan. Therefore, this impact (HAZ-4) is less than significant for this period.

Exacerbation of Climate Change Effects

The proposed Plan could exacerbate potential climate change effects on emergency response and access. Climate change may cause events like wildfire or flooding to obstruct roads for emergency vehicles. The proposed Plan's increased development and transportation network improvements could also obstruct emergency response vehicles or result in activities that interfere with implementation of emergency response or an evacuation plan. Even though the proposed Plan would adhere to regulations to avoid this, climate change effects could make this more difficult, though it is uncertain to what degree climate change hazards could obstruct roads for emergency access.

4.10 HYDROLOGY AND WATER QUALITY

This section evaluates the hydrology and water quality impacts of the proposed Plan.

4.10.1 EXISTING CONDITIONS

HYDROLOGY

Surface Waters

Surface waters in the San Diego region include the area's ocean shoreline, bays, lagoons, lakes, reservoirs, playas/inundation areas/washes, streams, and rivers (Figure 4.10-1). Major rivers within the San Diego region include the Santa Margarita River, the San Luis Rey River, San Dieguito River, San Diego River, Sweetwater River, Otay River, and the Tijuana River. Major coastal waterbodies include Buena Vista Lagoon, Agua Hedionda Lagoon, Batiquitos Lagoon, San Elijo Lagoon, San Dieguito Lagoon, Los Peñasquitos Lagoon, Mission Bay, San Diego Bay, Tijuana River estuary, and the Pacific Ocean. Playas/inundation areas/washes include areas surrounding Lake Henshaw, Lake Cuyamaca, Moreno Reservoir, and Lake Hodges, as shown in Figure 4.10-1.

Watersheds and Hydrological Characteristics

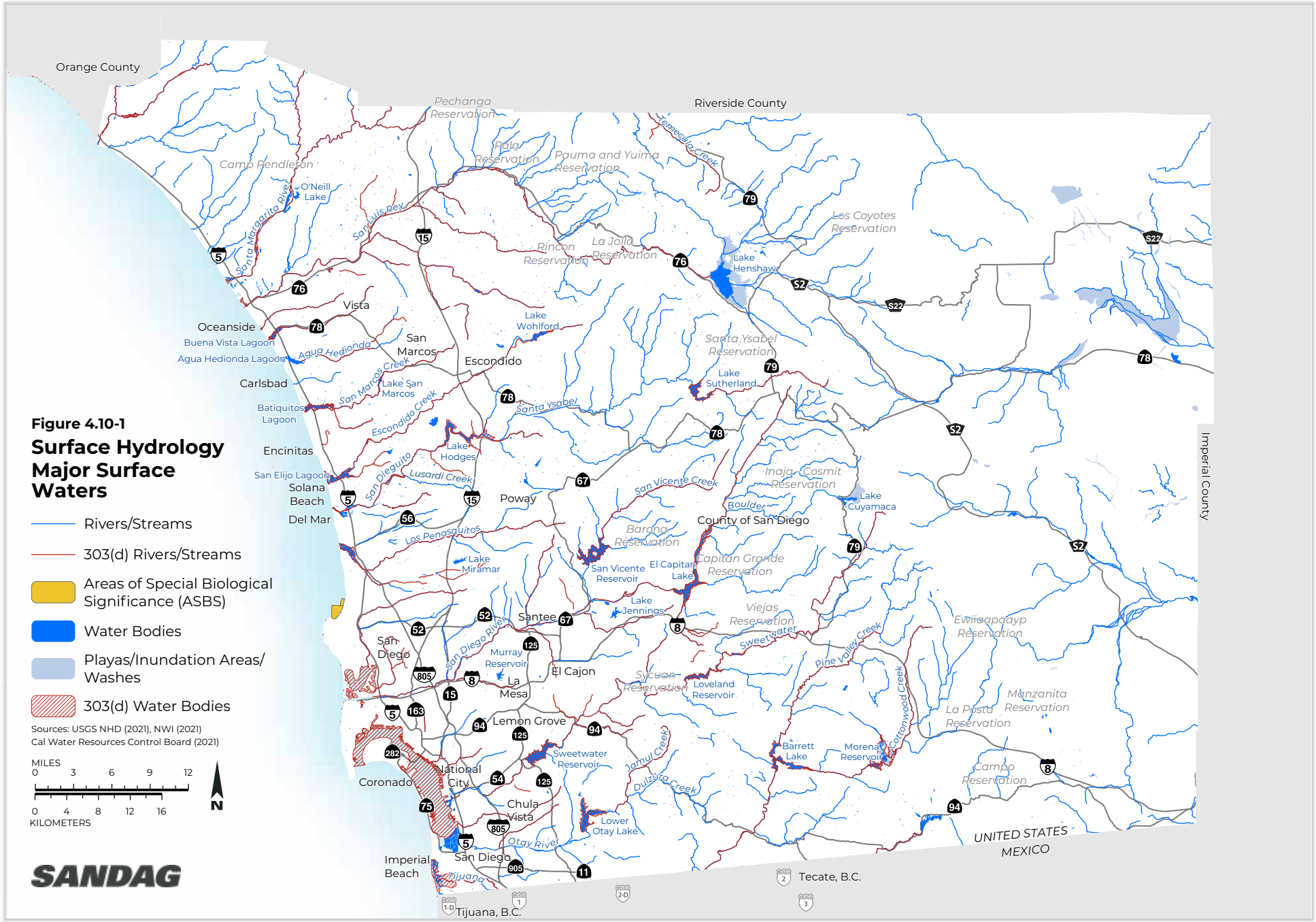
The San Diego region is divided into two hydrologic basins by the northwest-trending Peninsular Range. The San Diego Hydrologic Basin is on the gently sloping western side of the range, and the Colorado River Hydrologic Basin is on the steep eastern side.

San Diego Hydrologic Basin

The San Diego Hydrologic Basin is divided into hydrologic units (HUs), which are entire watersheds made up of one or more rivers or streams. Each HU, or watershed, is divided into hydrologic areas (HAs), which are the major tributaries or major groundwater basins within the watershed. Hydrologic subareas (HSAs), which include water-bearing and non-water-bearing formations, are major subdivisions of HAs.

The San Diego Hydrologic Basin includes 11 HUs (watersheds). The Carlsbad, San Dieguito, Los Peñasquitos, San Diego, Pueblo San Diego, Sweetwater, and Otay watersheds are located entirely within the San Diego region. The San Luis Rey, San Juan, Santa Margarita, and Tijuana watersheds are located in both the San Diego region and neighboring jurisdictions: Orange County, Riverside County, and Baja California, Mexico, respectively. All 11 watersheds ultimately drain to the Pacific Ocean. Figure 4.10-2 shows the watersheds and the groundwater basins.

The major characteristics of the 11 watersheds are described below. Beneficial uses of water bodies within these watersheds are described in the *Water Quality* section that follows under *Beneficial Uses/Water Quality Objectives*.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
Santa Ysabel Reservation
Inaja Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Sycuan Reservation
Ewiiaapaayp Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Camp Pendleton
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
San Diego
Tijuana
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Lake Henshaw
Lake Wohlford
Lake San Marcos
Lake Hodges
Lake Sutherland
Lake Cuyamaca
Lake Miramar
San Vicente Reservoir
El Capitan Lake
Lake Jennings
Murray Reservoir
Loveland Reservoir
Sweetwater Reservoir
Barrett Lake
Morena Reservoir
Lower Otay Lake
O'Neill Lake
Buena Vista Lagoon
Agua Hedionda Lagoon
Batiquitos Lagoon
San Elijo Lagoon
Santa Margarita River
San Luis Rey
Agua Hedionda
San Marcos Creek
Escondido Creek
San Dieguito
Lusardi Creek
Los Penasquitos
Santa Ysabel
San Vicente Creek
Boulder
Tenaja Creek
Sweetwater
Pine Valley Creek
Cottonwood Creek
Jamul Creek
Dulzura Creek
San Diego River
Otay River
Figure 4.10-1
Surface Hydrology
Major Surface Waters
Rivers/Streams
303(d) Rivers/Streams
Areas of Special Biological Significance (ASBS)
Water Bodies
Playas/Inundation Areas/ Washes
303(d) Water Bodies
Sources: USGS NHD (2021), NWI (2021)
Cal Water Resources Control Board (2021)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

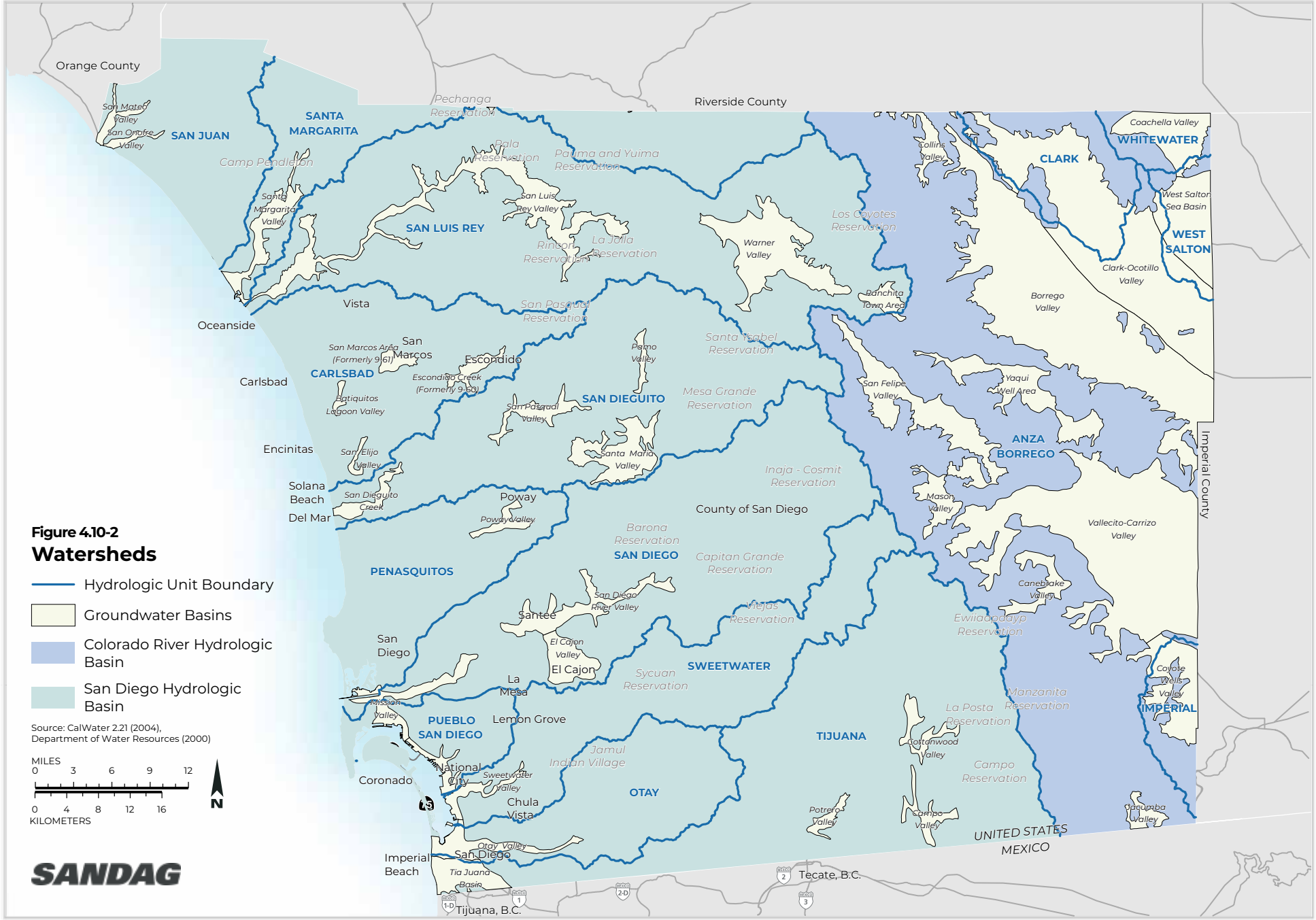


Figure 4.10-2

Watersheds

- Hydrologic Unit Boundary
- Groundwater Basins
- Colorado River Hydrologic Basin
- San Diego Hydrologic Basin

Source: CalWater 2.21 (2004), Department of Water Resources (2000)

SANDAG

San Juan watershed (HAs 901.1 to 901.5) covers approximately 496 square miles, of which only 150 square miles lie in the northwest portion of the San Diego region. Most of the watershed lies within Marine Corps Base (MCB) Camp Pendleton in Orange and Riverside counties. Two of its hydrological areas are within the San Diego region (San Onofre [901.5] and San Mateo [901.4]). The San Onofre Hydrologic Area is completely within the boundaries of the County of San Diego. It encompasses approximately 37,500 acres near the northern border of the County, and 97 percent of it is dedicated to military uses associated with Marine Corps Base Camp Pendleton. The San Mateo Canyon Hydrologic Area is approximately 31,000 acres within San Diego County, and approximately 53 percent is incorporated into Marine Corps Base Camp Pendleton. The remaining portions are unincorporated and include some park lands and other open spaces. Major stream systems include the San Mateo Creek, San Onofre Creek, and Jardine Creek. Topography varies from Pacific Ocean coastal plains to the Santa Margarita Mountains (over 2,000 feet above mean sea level [AMSL]). Various wildlife species use the undeveloped, low-lying creeks and streambeds as corridors to range freely within MCB Camp Pendleton and eastward into higher elevations. Water quality monitoring indicates that the watershed's surface waters are high in total dissolved solids (TDS) (PCW 2018).

Santa Margarita watershed (HAs 902.1 to 902.9) encompasses approximately 750 square miles, of which only 200 square miles lie in the northern San Diego region. Most of the flow from the Santa Margarita River main stem is within the San Diego region and traverses through unincorporated areas, the community of Fallbrook, and MCB Camp Pendleton. The lower river and estuary at the Pacific Ocean coast are relatively less developed than the coastline to the south and, as a result, support abundant habitat and wildlife. The majority of the watershed is undeveloped (approximately 44 percent). Other land uses include agriculture (7 percent), military (30 percent), miscellaneous land uses (11 percent), and residential (8 percent). Presently, several waterbodies are impaired due to excessive nutrients from a variety of sources including agriculture, nursery operations, municipal wastewater discharges, urban runoff, septic systems, and golf course operations (PCW 2018). Other major characteristics of this watershed are excessive sedimentation from urban development and agricultural areas, groundwater degradation and contamination with nitrates and other salts, habitat loss, channelization, flooding, and scour (PCW 2018).

San Luis Rey watershed (HAs 903.1 to 903.3) is the third largest HU in the San Diego region (562-square-mile drainage area). Situated in the northwestern portion of the San Diego region, the basin has two major surface waters, the San Luis Rey River and Lake Henshaw, and is divided into three HAs: the lower San Luis, Monserate, and Warner Valley. Roughly 25 percent of the land area in the watershed is located west of Interstate 15 (I-15), where land uses include open space/undeveloped, residential, commercial/industrial, and agricultural. East of I-15, most of the land is owned and managed by government agencies (county, State, and federal), special districts, and tribal governments. Approximately 54 percent of the land in the watershed is vacant or undeveloped. The next largest land uses in the watershed are residential (15 percent), tribal reservations (14 percent), and agriculture (14 percent). The lower San Luis Rey River is impaired for chloride and TDS. Water quality impairments within the watershed are bacteria and nutrients (PCW 2018).

Carlsbad watershed (HAs 904.1 to 904.6), extending from the headwaters above Lake Wohlford to the Pacific Ocean, is approximately 211 square miles in area. Within the watershed there are six HAs: Buena Vista Creek, Agua Hedionda, Loma Alta, Canyon de las Encinas, San Marcos, and Escondido Creek. Each HA drains into the Pacific Ocean through creeks and rivers to discrete coastal lagoons. There are also two large water reservoirs, Lake Wohlford and Dixon Lake. The Carlsbad watershed is approximately 48 percent urbanized, and its population ranks as the third mostly densely populated in the San Diego region (PCW 2018). The dominant land uses within the watershed are residential (29 percent), freeways and roads (12 percent), agriculture (12 percent), commercial/industrial (6 percent), miscellaneous uses (9 percent) and vacant/undeveloped (32 percent) (PCW 2018). As a result of this level of urbanization, water quality impairments include excessive

coliform bacteria and sediment loading from upstream sources. The coastal lagoons are critical freshwater and estuarine habitats for numerous plant and animal species (PCW 2018).

San Dieguito watershed (HAs 905.1 to 905.5) comprises a drainage area of approximately 345 square miles in the west-central San Diego region from the Volcan Mountains to the San Dieguito lagoon at the Pacific coastline. Just over half of the land in the watershed (61 percent) is vacant or undeveloped (PCW 2018). The remaining 39 percent of the land area is being utilized as residential areas (18 percent), agriculture (14 percent), and other (7 percent). Major features within the watershed include the San Dieguito River Park, San Dieguito Lagoon, and water storage reservoirs, including Lake Hodges, Lake Sutherland, and Lake Poway. Ocean waters along the coastline at the mouth of the San Dieguito River exhibit elevated levels of coliform bacteria. San Dieguito Lagoon is especially sensitive to the effects of pollutants and oxygen depletion due to restricted or intermittent tidal flushing (PCW 2018).

Los Peñasquitos watershed (HAs 906.1 to 906.5) is composed of the Los Peñasquitos Creek watershed (HAs 906.10 to 906.20), several coastal tributaries (906.30), and the Mission Bay watershed (HAs 906.40 to 906.50). These watersheds drain a highly urbanized area located almost entirely west of I-15 in coastal parts of the San Diego region. In HAs 906.1 and 906.2 about 46 percent of the watershed remains undeveloped or has otherwise been dedicated to open space and recreational lands. The remaining 54 percent of the land area is being utilized as residential areas (27 percent), roadways and transportation (12 percent), and other uses (15 percent). The remaining "other" 15 percent includes industrial, office, commercial, and agricultural land uses. The major receiving waters, Los Peñasquitos Lagoon and Mission Bay, are both fragile systems that support diverse native fauna and flora and are especially sensitive to the effects of pollutants due to restricted or intermittent tidal flushing (PCW 2018). The Los Peñasquitos Creek watershed encompasses a land area of approximately 94 square miles including portions of the cities of San Diego, Poway, and Del Mar. Los Peñasquitos Creek discharges into Los Peñasquitos Lagoon, which is impaired for sedimentation. Functionally, the Los Peñasquitos WMA works in conjunction with the Mission Bay/La Jolla WMA to form a single hydrologic unit, or watershed. The Mission Bay watershed drains approximately 64 square miles. In HAs 906.3–906.5, about 37 percent remains undeveloped or has otherwise been dedicated to open space and recreational lands. The remaining 63 percent of the land area is being utilized as residential areas (28 percent), roadways and transportation (16 percent), office and institutional lands (7 percent), and other (12 percent). The remaining "other" 12 percent includes industrial, commercial, and agricultural land uses. Rose Creek and Tecolote Creek are the main tributaries to Mission Bay. Cudahy Creek is another tributary crucial to the WMA. Much of Mission Bay is impaired by coliform bacteria from urban runoff and sewage spills; Tecolote Creek is impaired by a host of pollutants, including coliform bacteria, trace metals, and toxicity (PCW 2018).

San Diego watershed (HAs 907.1 to 907.4) is the second largest hydrologic unit in the San Diego region (approximately 434 square miles) and hosts the highest population (approximately 520,000 residents) of the region's watersheds. Approximately 44 percent of the watershed is undeveloped, mainly in the upper, eastern portion. The lower reaches of the watershed are more urbanized with open space and park land (23 percent); residential (19 percent); transportation (6 percent); and commercial, agricultural, industrial, military, and miscellaneous land uses (2 percent) land uses predominating (PCW 2018). Five reservoirs in this watershed supply water to as many as approximately 760,000 residents in the region. The Cleveland National Forest, Mission Trails Regional Park, and the river floodplain near Lakeside are undeveloped areas that host a variety of intact habitats and endangered species (PCW 2018). Famosa Slough, near the mouth of the San Diego River, contains high quality wetland habitat (PCW 2018). Beach postings and closures from elevated bacteria levels at the mouth of the river have been attributed to urban runoff and sewage spills (PCW 2018).

Pueblo San Diego watershed (HAs 908.1 to 908.3) is the smallest hydrologic unit in the San Diego region (approximately 60 square miles) and the most densely populated (approximately 500,000 residents). It drains to San Diego Bay. This watershed is approximately 75 percent developed with urban uses, but the dominant land use remains relatively consistent between hydrologic areas. Residential areas are the primary land use in all three of its hydrologic areas, comprising 32 percent, 40 percent, and 46 percent of the total land area of the Point Loma (908.1), San Diego Mesa (908.2), and National City (908.3) HAs, respectively (PCW 2018). Also contained within the Pueblo San Diego watershed is the Point Loma Ecological Reserve, a 650-acre coastal park located near the tip of the Point Loma peninsula. The creeks in the watershed are impaired by urban runoff, and Chollas Creek and the mouth of the creek in San Diego Bay are impaired for various trace metals parameters and aquatic toxicity (PCW 2018). Five locations of San Diego Bay, which receives runoff from the Pueblo San Diego watershed, are identified as toxic hot spots by California's Bay Protection Toxic Cleanup Program (PCW 2018). Toxic hot spots are identified as areas where pollutants have accumulated in the water or sediment to levels that may pose a hazard to aquatic life, wildlife, fisheries, or human health, may impact beneficial uses, or may exceed water quality or sediment quality objectives adopted by the State Water Resource Control Board (SWRCB) or Regional Water Quality Control Board (RWQCB).

Sweetwater watershed (HAs 909.1 to 909.3) drains approximately 230 square miles. It is one of three watersheds that drain to San Diego Bay (along with Otay and Pueblo San Diego). Approximately 86 percent of the watershed is within unincorporated County of San Diego jurisdiction. Over half of the watershed is undeveloped and open space lands (60 percent). The Lower Sweetwater is the most urbanized, with residential areas leading at 44 percent, followed by transportation at 18 percent of land area. Undeveloped and open space lands dominate the majority of the area within the Middle and Upper Sweetwater Hydrologic Areas, making up 63 percent and 82 percent, respectively. Residential land uses follow in each of the hydrologic areas, with 28 percent and 12 percent of the total in each of the Middle and Upper Sweetwater Hydrologic Areas. Major characteristics include municipal water supplies and sensitive wetland and wildlife habitats (PCW 2018). The upper portion of the watershed contains large undeveloped areas within the Cleveland National Forest and Cuyamaca Rancho State Park; the unincorporated communities of Pine Valley, Descanso, and Alpine; and the Viejas Indian Reservation. The central part of the watershed consists of unincorporated rural and suburban communities, while the urbanized lower part contains portions of several cities, including San Diego, National City, Chula Vista, La Mesa, and Lemon Grove. Water quality impairments within the watershed are coliform bacteria, enterococcus, trace metals, and other toxics (PCW 2018).

Otay watershed (HAs 910.1 to 910.3) encompasses approximately 160 square miles in the southwest San Diego region and is one of the three watersheds that discharge to San Diego Bay. The watershed consists largely of unincorporated County of San Diego jurisdiction and also includes portions of the cities of Chula Vista, Imperial Beach, Coronado, National City, and San Diego. The predominant land uses in the watershed are open space (68 percent) (PCW 2018). Land uses within the Otay watershed vary extensively by HA. In the Coronado HA (910.1), military uses are 52 percent and open space and undeveloped lands only comprise three percent of the land area. In Otay Valley (910.2) and Dulzura (910.3), open spaces and undeveloped lands make up 47 percent and 83 percent of land area, respectively. In each of those HAs, residential land uses follow with 16 percent and 18 percent of land area, trailed by transportation, industrial, and institutional uses. Upper and Lower Otay Lakes provide a potable water supply, wildlife habitat, and recreational opportunities. Water quality impairments are limited to the presence of elevated coliform bacteria in the Pacific Ocean receiving waters near Coronado (PCW 2018).

Tijuana watershed (HAs 911.1 to 911.8) is the largest in the San Diego region with a drainage area of approximately 1,750 square miles (27 percent on the U.S. side of the international border and 73 percent on the Mexico side). Within the U.S.-controlled Tijuana watershed, most of the land remains undeveloped at

86 percent of the land area, followed by residential land uses at seven percent, agricultural land uses at three percent, and transportation at two percent. The Tijuana Estuary, a National Estuarine Sanctuary that supports a variety of threatened and endangered plants and animals, is threatened by inflows from the Tijuana River containing high concentrations of coliform bacteria; sediment; trace metals (copper, lead, zinc, chromium, nickel, and cadmium); polychlorinated biphenyls (PCBs); and other urban, agricultural, and industrial pollutants. Sources of these pollutants include urban runoff, sewage spills, industrial discharges, agriculture, orchards, livestock, domestic animals, and septic systems (PCW 2018).

Colorado River Hydrologic Basin

The Colorado River Hydrologic Basin has small portions of five HUs located within the eastern San Diego region. These units include the Anza-Borrego watershed, which is the largest hydrologic unit, covering about 80 percent of the desert portion of San Diego County and extending into Imperial and Riverside counties. Portions of the Clark, Whitewater, and West Salton watersheds are located at the extreme northeast corner of the San Diego region. The Imperial watershed is located at the southeast edge of the San Diego region and extends into Imperial County. Water is limited in all of these areas. The surface water that intermittently exists flows toward the Salton Sea and the Colorado River. Average annual precipitation in this area ranges from less than 3 inches along the eastern boundary, near Imperial Valley, to 25 inches in the mountain divide between the Salton Sea and Pacific Ocean drainages. Runoff occurs from winter precipitation especially in the higher elevations and from summer thunderstorms. The majority of the land uses within the San Diego region portion of the Colorado River Hydrologic Basin are parkland, undeveloped land, or agriculture. The remaining portions are sparsely populated with single-family residential units, and a small amount of other uses. (County of San Diego 2011)

The Colorado River Basin RWQCB divides the Colorado River Hydrologic Basin into seven major planning areas based on economic and hydrologic characteristics. Only three of these planning areas lie within the San Diego region: Coachella Valley, Anza Borrego, and Imperial Valley. The other four that fall outside of the San Diego region are Lucerne Valley, Hayfield, Salton Sea, and the East Colorado River Basin. Characteristics of each of the three Colorado River Hydrologic Basin planning areas in the San Diego region are described below:

The Anza Borrego Planning Area includes the Clark, West Salton Sea, and Anza-Borrego HUs. It comprises 1,000 square miles, mostly within the San Diego region and Imperial County, with a small segment in Riverside County. Elevations range from 230 feet below sea level at the Salton Sea to over 6,000 feet along the western boundary. The principal communities in the planning area are Salton City and Borrego Springs. Drainage flows to the Salton Sea except for two small areas of internal drainage in Clark and Borrego Valleys in the northwest corner of the planning area. Average annual precipitation ranges from less than 3 inches along the eastern boundary, near Imperial Valley, to 25 inches in the mountain divide between the Salton Sea and Pacific Ocean drainages. Runoff occurs from winter precipitation especially in the higher elevations and from summer thunderstorms. Perennial flow includes reaches of Coyote Creek and San Felipe Creek. (CRWQCB 2017)

The Coachella Valley Planning Area contains the Whitewater HU and the East Salton Sea HU. It lies almost entirely in Riverside County and covers 1,920 square miles in the west-central portion of the Colorado River Hydrologic Basin. Only a small area in the southernmost portion lies within the San Diego region. Elevations range from over 10,000 feet in the San Jacinto Mountains to 230 feet below sea level at the Salton Sea shoreline. The higher elevations of the San Bernardino and San Jacinto mountains have evergreen forests with perennial streams. A contrasting scene is presented on the Coachella Valley floor where the land contains desert vegetation, except where the land has been irrigated with pumped groundwater or with imported Colorado River water. Average annual precipitation ranges from less than 3 inches in the valleys to 40 inches in the San

Bernardino Mountains. Seasonal snows fall on the higher elevations in the San Bernardino and San Jacinto mountains. In the valleys, precipitation from summer thunderstorms often exceeds that of winter. Runoff resulting from rains and snowmelt at the higher elevations is the major source of groundwater replenishment. Perennial streams include the upper reaches of the San Gorgonio and Whitewater rivers, and Palm Canyon, Tahquitz, Snow, Deep Canyon, Chino, and Andreas creeks. The Whitewater River is the major drainage course in the planning area. There is perennial flow in the mountains, but because of diversions and percolation into the basin, the river becomes dry farther downstream. The constructed downstream extension of the Whitewater River channel, known as the Coachella Valley Storm Water Channel, serves as a drainage way for irrigation return flows, treated community wastewater, and storm runoff. There is one relatively large surface water impoundment. Lake Cahuilla, at the terminus of the Coachella Canal, serves as a storage reservoir to regulate irrigation water demands and is also used for recreational purposes. (CRWQCB 2017)

The Imperial Valley Planning Area comprises 2,500 square miles in the southern portion of the Colorado River Hydrologic Basin, almost all of it in Imperial County. A small portion in the southwestern part of the planning area lies within the San Diego region. The easterly and westerly boundaries are contiguous with the westerly and easterly boundaries of the East Colorado River Basin and the Anza-Borrego Planning Area, respectively. Its northerly boundary is along the Salton Sea and the Coachella Valley Planning Area and its southerly boundary follows the international border with Mexico. The planning area's central feature is the flat, fertile Imperial Valley. The principal communities are El Centro, Brawley, and Calexico. Surface waters mostly drain toward the Salton Sea. The New and Alamo rivers convey agricultural irrigation drainage water from farmlands in the Imperial Valley, surface runoff, and lesser amounts of treated municipal and industrial waste waters from the Imperial Valley. The flow in the New River also contains agricultural drainage, treated and untreated sewage, and industrial waste discharges from Mexicali, Mexico. Average annual precipitation ranges from less than 3 inches over most of the planning area to about 8 inches in the Coyote Mountains on the western border. Colorado River water, imported via the All American Canal, is the predominant water supply and is used for irrigation, industrial, and domestic purposes. (CRWQCB 2017).

Groundwater Hydrology

Groundwater supplies within the San Diego region are limited by several factors including the limited distribution of sand and gravel (alluvial) aquifers and their relatively shallow nature, lack of rainfall and associated groundwater recharge, and degraded water quality from human activities. Only a small portion of the region is underlain by permeable geologic formations that can accept, transmit, and yield appreciable amounts of groundwater, which leaves a limited amount of available groundwater.

Groundwater basins underlie about 277,000 acres (433 square miles) or about 11 percent of the region's surface, and groundwater is found in unconfined alluvial aquifers in most of the region's basins. In some larger basins, typified by those underlying the coastal plain, groundwater occurs in multiple aquifers that create confined groundwater conditions.

The San Diego region overlies three general categories of aquifers: alluvial and sedimentary aquifers, fractured rock aquifers, and desert basin aquifers (County of San Diego 2010). San Diego County is underlain primarily by fractured rock aquifers and alluvial and sedimentary aquifers. Desert basins, which underlie approximately 14 percent of the unincorporated portion of the County, are located in eastern San Diego County (County of San Diego 2010). Aquifers composed of alluvial deposits (alluvium) yield much of the groundwater production capacity in the region (San Diego IRWM Program 2019). Alluvial and sedimentary aquifers (or groundwater basins) underlay a relatively small area of the region and account for approximately 13 percent of the unincorporated areas. These groundwater basins are typically found in river and stream valleys, around

lagoons, near the coastline, and in the intermountain valleys (Figure 4.10-2 maps these groundwater basins). Sediments in these aquifers are composed of mostly consolidated (defined as sedimentary rock) or unconsolidated (defined as alluvium or colluvium) gravel, sand, silt, and clay. Most of these alluvial basins have relatively high hydraulic conductivity, porosity, and storage and generally would be considered good aquifers on the basis of their hydrogeologic characteristics. However, some alluvial basins in the San Diego region have relatively thin saturated thickness and limited storage, but can be underlain by fractured rock aquifers, which can potentially provide additional storage (County of San Diego 2011). Because alluvial basins generally occur in low-lying areas of a watershed, surface water bodies and surface water runoff within alluvial basins may provide additional recharge to these basins. Alluvial and sedimentary aquifers typically have significant storage capacity, with specific yield values between 1 and 30 percent (County of San Diego 2010).

Surface water bodies within an alluvial or sedimentary aquifer may increase the recharge due to leakage from the water body into the subsurface. Because alluvial basins generally occur in low-lying areas of a watershed, surface water runoff may accumulate in streams, lakes, or other surface depressions within alluvial basins and can provide an additional recharge source to these basins (County of San Diego 2010). The San Diego County Water Authority reports that existing groundwater production produced an annual average of approximately 22,300 acre-feet per year of potable water supplies from groundwater (SDCWA 2021a). Aside from the Warner, San Luis Rey Valley, and Sweetwater Valley Basins, none of the region's alluvial aquifers exceed a storage capacity of 100,000 acre-feet. Ten alluvial aquifers, however, are estimated to exceed 50,000 acre-feet (San Diego IRWM Program 2019). The San Diego IRWM Region contains 22 separate groundwater basins, as defined by the California Department of Water Resources (DWR) Bulletin 118 (San Diego IRWM Program 2019). These groundwater basins are:

- San Mateo Valley
- San Onofre Valley
- Santa Margarita Valley
- San Luis Rey Valley
- Warner Valley
- Escondido Valley
- San Pasqual Valley
- Santa Maria Valley
- San Dieguito Creek
- Poway Valley
- Mission Valley
- San Diego River Valley
- El Cajon Valley
- San Diego Formation
- Batiquitos Lagoon Valley
- San Elijo Valley
- Pamo Valley
- Ranchita Town Area
- Cottonwood Valley
- Campo Valley
- Potrero Valley
- San Marcos Area

Significant groundwater resources have been found to exist in deeper aquifers composed of semi-consolidated or consolidated sediments. Recent field investigations indicate that one such deep aquifer, the San Diego Formation, has significant unused water storage and groundwater production potential. The San Diego

Formation has been estimated to contain approximately 270,000 to 360,000 acre-feet of groundwater (San Diego IRWM Program 2019).

Fractured rock underlies approximately 73 percent of the unincorporated area of the County. The majority of the mountainous region of the County consists of these fractured rocks, and typically have much less storage capacity than alluvial aquifers (County of San Diego 2011). Additionally, due to the low storage capacity, recharge to fractured rock aquifers can cause relatively fast rises to the water table, and similarly fast declines to the water table from groundwater pumping in years without significant recharge (County of San Diego 2010). Storage in fractured rock within the County spans several orders of magnitude from essentially zero up to 1 percent of the total volume of the aquifer. Specific yield values in San Diego County fractured rock are estimated to range from about 0.001 to 1 percent (County of San Diego 2010). In some instances wells may derive water from only one or a few water-bearing fractures. Additionally, it is very difficult to estimate potential production rates for any new well drilled, and wells drilled only a few tens of feet from one another may have significantly different water production rates. This is because water-producing fracture locations and orientations are difficult to identify and predict, and fractures intersected by one well may not be intersected by nearby wells (County of San Diego 2010).

Desert basin aquifers are found in the easternmost area of the San Diego region in residual sediments. Desert basin aquifers are characterized by extremely limited groundwater recharge and large storage capacities (County of San Diego 2011). In eastern San Diego County, most development occurs over the Borrego Valley Groundwater Basin. The Borrego Valley aquifer (Figure 4.10-2), which is completely groundwater dependent, has a well-documented groundwater overdraft condition where year after year groundwater extraction exceeds the amount of groundwater that is recharged back into the aquifer. The land uses in Borrego Valley primarily include residential, agricultural, recreational, and commercial uses. The source of recharge was estimated to come primarily from three major drainages: Coyote Creek (approximately 65 percent), Borrego Palm Canyon, and San Felipe Creek (approximately 35 percent combined). Little recharge, if any from San Felipe Creek benefits users in Borrego Springs as the majority exits Borrego Valley and flows toward Ocotillo Wells (County of San Diego 2010).

Groundwater in the coastal communities of the San Diego region is relatively shallow as a result of the proximity of the ocean and can be approximated based on the elevation of an area. In general, groundwater is encountered a few feet AMSL in Downtown San Diego. Areas close to San Diego Bay may see daily changes in groundwater level resulting from tidal variation. Groundwater levels in other areas of the San Diego region may be locally affected by temporary dewatering systems for adjacent structures under construction.

The Sustainable Groundwater Management Act (SGMA) requires basins to be sustainably managed by local public agencies (e.g., counties, cities, and water agencies) that become groundwater sustainability agencies (GSAs). The primary purpose of the GSAs is to develop and implement a Groundwater Sustainability Plan (GSP) to achieve long-term groundwater sustainability. See Section 4.18, *Water Supply*, for further discussion on this topic.

WATER QUALITY

This section describes existing groundwater and surface water quality within the region's two hydrologic basins.

Colorado River Hydrologic Basin Water Quality

The Colorado River is the primary source of the Water Authority's imported water supply. High salinity levels, uranium, and perchlorate contamination represent the primary areas of concern with the quality of Colorado River supplies. The salts in the Colorado River system are indigenous and pervasive, mostly resulting from saline sediments in the basin that were deposited in prehistoric marine environments. They are easily eroded, dissolved, and transported into the river system. Agricultural development and water diversions over the past 50 years increase the already high, naturally occurring levels of TDS. Naturally occurring uranium and arsenic are monitored by drinking water agencies. The Metropolitan Water District adopted a Perchlorate Action Plan in 2002 following detection of perchlorate contamination, which includes continued tracking, remediation, and monitoring (SDCWA 2016).

Beneficial uses identified for surface waters in the Water Quality Control Plan for the Colorado River Basin (California Water Boards 2019) for the San Diego region are:

- MUN: Municipal and Domestic Supply
- AGR: Agricultural Supply
- AQUA: Aquaculture
- IND: Industrial Service Supply
- GWR: Groundwater Recharge
- REC-1: Contact Water Recreation
- REC-2: Non-Contact Water Recreation
- WARM: Warm Freshwater Habitat
- COLD: Cold Freshwater Habitat
- WILD: Wildlife Habitat
- POW: Hydropower Generation
- RARE: Rare, Threatened, or Endangered Species

The water quality discussion for this region is focused on the Borrego Valley Groundwater Basin. The most extensive water quality monitoring data within the Borrego Springs Subbasin comes from reporting by public water supply systems to the SWRCB Division of Drinking Water for the purpose of ensuring adequate drinking water quality (BVGSA 2019). There are both anthropogenic and natural sources of the contaminates of concern (COCs) in the Borrego Springs Subbasin. Anthropogenic sources that may contribute to degradation of the current water quality in the Subbasin include agricultural use of pesticides and fertilizers, salt accumulation resulting from agricultural irrigation practices, and household septic system return flows. Natural sources of COCs in the Subbasin include the rocks and minerals that comprise the aquifer matrix material. These naturally occurring COCs contain evaporite minerals, which can dissolve and increase TDS concentration in the aquifer; silicate minerals, which can contribute arsenic to the groundwater; and sulfate minerals, which can contribute sulfate to the groundwater. All are found in differing amounts in the upper, middle, and lower aquifers. Differences in the mineralogical composition of the aquifers can result in groundwater quality differences between the aquifers. (BVGSA 2019).

In general, water quality has historically been good within Borrego Water District's wells with TDS at concentrations of less than 500 milligrams per liter. The high proportion of sulfate in the surface water of

Coyote Creek appears to dominate the character of groundwater in the northern and eastern parts of the basin. The more bicarbonate waters of Borrego Palm Canyon and Big Spring influence the groundwater along the western and southern parts of the basin. Historical issues with elevated nitrate concentrations have been noted as evidenced by wells either taken out of production or drilled deeper. High salinity, poor-quality connate water is thought to occur in deeper formational materials in select areas of the aquifer as well as shallow groundwater in the vicinity of the Borrego Sink in the southern portion of the Plan Area. Water quality impacts may occur as decreased groundwater levels could induce flow of poor quality water (i.e., unsuitable for municipal uses) found in select deeper formational materials of the aquifer. This may eventually necessitate additional expensive treatment of groundwater to make the water suitable as a drinking water supply. (BVGSA 2019)

Beneficial uses identified in the Colorado River Basin Plan (California Water Boards 2019) for groundwaters in the San Diego region are:

- MUN: Municipal and Domestic Supply
- AGR: Agricultural Supply
- IND: Industrial Service Supply

San Diego Hydrologic Basin Surface Water and Groundwater Quality

Untreated stormwater can contain a number of pollutants that may eventually flow to surface water and groundwater. A primary cause of water pollution is the discharge of inadequately treated stormwater runoff that is allowed to discharge into natural receiving waters (e.g., lakes, streams, the ocean). Growth and urbanization have placed increased pressure on water resources and resulted in local impacts on water quality, especially in the highly urbanized western portion of the San Diego region, within the San Diego RWQCB boundaries. The urbanized areas of the region exhibit a large amount of impervious surfaces, thus reducing the amount of water that would normally infiltrate into the soil and be filtered naturally. Pollutants, such as motor oil, antifreeze, sediment, metals, fertilizers and pesticides, and bacteria and viruses can be transported to surface waters and groundwater in stormwater runoff. The stormwater conveyance systems in the region are not connected with the sanitary sewer systems; therefore, urban runoff in the region typically flows directly to surface waters and groundwater basins. Current levels of pollution (or impairment) in the region's surface waters are discussed in the sections that follow.

Traditionally, groundwater supplies within the San Diego region have produced high-quality drinking water. However, naturally occurring and more recent anthropogenic sources of contamination have impacted groundwater quality in some localized areas throughout the County. Groundwater contamination from anthropogenic sources are typically associated with leaking underground storage tanks such as from gasoline stations or other industrial uses with underground storage tanks. The SWRCB maintains the GeoTracker database of several types of sites in California including permitted underground storage tanks; leaking underground storage tanks; and Spills, Leaks, Investigations, and Cleanups sites. According to GeoTracker, there are over 3,000 leaking underground storage tank listings in the San Diego region (SWRCB 2021). Not all these sites represent areas of groundwater contamination, but they do identify the potential extent of possible localized areas of contamination. While alluvial groundwater aquifers can be quickly recharged by stormwater or urban runoff, the porous nature of the aquifers render them susceptible to contamination by activities on the ground surface, such as septic tank use in rural areas within the San Diego region, contaminated stormwater infiltration, abandoned well heads, and leaking underground storage tanks. The most common contaminants in groundwater within the San Diego region are elevated nitrate, TDS, iron and manganese, and toxic organic pollutants (Regional Water Management Group 2013).

Stormwater Drainage Facilities and Management

The San Diego region includes urban development and associated infrastructure (e.g., roads, sidewalks, gutters, etc.). The conversion of undeveloped areas to urbanized uses in the region's watersheds has contributed to increased runoff rates and volumes, altered drainage patterns, and increased potential for flooding. Construction of impervious surfaces such as rooftops, roads, and driveways reduces the amount of rainfall that can infiltrate into the earth and increases runoff within a watershed. Subsequently, artificial conveyances such as gutters, storm pipes, and concrete-lining channel improvements accelerate flow rates that are directly conveyed into receiving waters (e.g., streams, rivers, reservoirs, Pacific Ocean) thereby increasing scour (erosion), promoting sediment transport, and concentrating flood risks.

The stormwater drainage system in the San Diego region comprises private and public drainage facilities other than sanitary sewers by which runoff is conveyed to receiving waters; it includes roads, streets, constructed channels, aqueducts, storm drains, pipes, street gutters, inlets to storm drains or pipes, and catch basins. The stormwater drainage system is designed to prevent flooding by transporting water away from developed areas. A vast amount of the unincorporated portion of the San Diego region is rural land that does not support or require stormwater drainage facilities. In contrast, most urban areas within the incorporated cities of the San Diego region have a range of stormwater drainage facilities that convey surface water runoff to the area's water bodies and ultimately the Pacific Ocean. (See Section 4.15, *Public Services and Utilities,* for a discussion of existing stormwater drainage facilities within the San Diego region.)

Wastewater Treatment Facilities

The San Diego region is served by over 7,935 miles of pressure and gravity sewer lines, as well as pipes, sewer laterals, and pump stations to move wastewater from its source to a wastewater treatment plant (WWTP). The treated wastewater is then released through ocean outfalls, percolation beds, or groundwater recharge.

The City of San Diego Metropolitan Wastewater Department, the largest wastewater treatment facility in the San Diego region, provides regional wastewater treatment services for the City of San Diego and 15 other cities and sanitation districts: Chula Vista, Coronado, Del Mar, El Cajon, Imperial Beach, La Mesa, National City, and Poway; the Lemon Grove Sanitation District; the Padre Dam Municipal and Otay water districts; and the County of San Diego (on behalf of the Winter Gardens Sewer Maintenance District and the Alpine, Lakeside, and Spring Valley sanitation districts). The City of San Diego Metropolitan Wastewater Department system comprises the Point Loma WWTP and Ocean Outfall, the North City Water Reclamation Plant (WRP) and South Bay WRP, and the Environmental Monitoring and Technical Services Laboratory. The Point Loma WWTP treats roughly 180 million gallons of wastewater per day (maximum capacity of 240 million gallons per day [mgd]) and discharges it through the Point Loma Ocean Outfall into the Pacific Ocean (City of San Diego 2018). Up to 30 mgd of wastewater can be treated at the North City WRP (City of San Diego 2015a). Water processed through the North City WRP is either returned to the sewer system, sent to the Point Loma WWTP, or transferred on to tertiary treatment to be used for reclaimed water purposes. The South Bay WRP has the capacity to process 15 mgd (City of San Diego 2018); water processed through the South Bay WRP can either be discharged into the ocean through the South Bay Ocean Outfall or sent on to tertiary treatment to be used for reclaimed water purposes.

The other two largest wastewater treatment facilities within the San Diego region are the Encina Water Pollution Control Facility and the City of Escondido Hale Avenue Resource Recovery Facility/Water Reclamation/Recycling Facility. The Encina Water Pollution Control Facility has the capacity to process approximately 43 mgd and treats about 22 MGD (EWA 2019); the Hale Avenue facility has the capacity to process 18 mgd and has an average daily flow of 12.7 MGD (City of Escondido 2019).

Beneficial Uses/Water Quality Objectives

Beneficial uses are defined as the uses of water necessary for the survival or well-being of humans, plants, and wildlife. Beneficial uses identified for surface waters in the Water Quality Control Plan for the San Diego Basin (Basin Plan) (San Diego RWQCB 2016) for the San Diego region are:

- MUN: Municipal and Domestic Supply
- AGR: Agricultural Supply
- IND: Industrial Service Supply
- PROC: Industrial Process Supply
- GWR: Groundwater Recharge
- FRESH: Freshwater Replenishment
- POW: Hydropower Generation
- REC-1: Contact Water Recreation
- REC-2: Non-Contact Water Recreation
- BIOL: Preservation of Biological Habitats of Special Significance
- WARM: Warm Freshwater Habitat
- COLD: Cold Freshwater Habitat
- WILD: Wildlife Habitat
- RARE: Rare, Threatened, or Endangered Species
- SPWN: Spawning, Reproduction, and/or Early Development

Beneficial uses identified in the Basin Plan (San Diego RWQCB 2016) for coastal waters are:

- IND: Industrial Service Supply
- NAV: Navigation
- REC-1: Contact Water Recreation
- REC-2: Non-Contact Water Recreation
- COMM: Commercial and Sport Fishing
- BIOL: Preservation of Biological Habitats of Special Significance
- EST: Estuarine Habitat
- WILD: Wildlife Habitat
- RARE: Rare, Threatened, or Endangered Species
- MAR: Marine Habitat
- AQUA: Aquaculture
- MIGR: Migration of Aquatic Organisms

- SPWN: Spawning, Reproduction, and/or Early Development
- SHELL: Shellfish Harvesting

Beneficial uses identified in the Basin Plan (San Diego RWQCB 2016) for groundwaters in the San Diego region are:

- MUN: Municipal and Domestic Supply
- AGR: Agricultural Supply
- IND: Industrial Service Supply
- PROC: Industrial Process Supply
- FRESH: Freshwater Replenishment

Narrative and numeric water quality objectives (WQOs) for all surface waters and groundwater within the San Diego region are established for a variety of constituents as described in the Basin Plan. Refer to Tables 3-2 and 3-3 in the Basin Plan (San Diego RWQCB 2016) for specific WQOs for each HA for inland surface waters and groundwater, respectively.

Areas of Special Biological Significance

The SWRCB's California Ocean Plan identifies 34 locations along the California coast as Areas of Special Biological Significance (ASBS). The Ocean Plan prohibits the discharge of wastes into these locations, thus barring discharges associated with industrial activities, publicly owned treatment works, and other traditional point discharges. In March 2012, the SWRCB released a Special Protections for ASBS, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges that defines design criteria for treating stormwater discharges and elimination of dry-weather discharges associated with non-stormwater sources (SWRCB 2012a). The two ASBS locations in the San Diego region (the La Jolla ASBS and San Diego-Scripps ASBS) are both within the Peñasquitos watershed. These locations are adjacent and extend from the northern bluffs of La Jolla through the University of California San Diego campus of the Scripps ~~Institute~~ Institution of Oceanography.

Clean Water Act Section 303(d) Impaired Waters

On June 9th, 2021, the U.S. Environmental Protection Agency (EPA) gave final approval to the SWRCB's 2018 California Integrated Report (CWA Section 303(d) List and 305(b) Report) (SWRCB 2021). Table 4.10-1 summarizes the impaired water segments and associated pollutants in the San Diego region, while Figure 4.10-1 illustrates the location of the region's impaired water body segments.

Table 4.10-1
2018 CWA Section 303(d) Impaired Waters in the San Diego Region

Impaired Water Body	Pollutant
Agua Hedionda Creek	Nitrogen, Manganese, Phosphorus, Indicator Bacteria, Selenium, Total Dissolved Solids, Toxicity, Benthic Community Effects, Bifenthrin, Chlorpyrifos, Cypermethrin, Malathion
Agua Hedionda Lagoon	Toxicity
Alpine Creek	Indicator Bacteria

Impaired Water Body	Pollutant
Alvarado Creek	Nitrogen, Selenium
Barrett Lake	Color, Manganese, Perchlorate, Phosphorus, Total Nitrogen as N, pH
Batiquitos Lagoon	Toxicity
Buena Creek	DDT, Indicator Bacteria, Nitrogen, Phosphorus, Nitrate and Nitrite
Buena Vista Creek	Benthic Community Effects, Bifenthrin, Selenium, Toxicity
Buena Vista Lagoon	Indicator Bacteria, Nutrients, Sedimentation/Siltation, Toxicity
Campo Creek	Indicator Bacteria
Carroll Canyon	Benthic Community Effects, Toxicity
Chocolate Creek	Nitrogen, Phosphorus, Indicator Bacteria
Chollas Creek	Bifenthrin, Chlorpyrifos, Copper, Cypermethrin, Diazinon, Indicator Bacteria, Lead, Malathion, Phosphorus, Nitrogen, Trash, Zinc
Cloverdale Creek	Nitrogen, Phosphorus, Total Dissolved Solids
Cottonwood Creek (San Marcos Creek Watershed)	Benthic Community Effects, DDT, Nitrogen, Phosphorus, Selenium, Toxicity
Cottonwood Creek (Tijuana River Watershed)	Indicator Bacteria, Selenium
Couser Canyon Creek	Cadmium, Indicator Bacteria, Selenium
Cristianitos Creek	
De Luz Creek	Iron, Manganese, Nitrogen, Sulfates
East Channel Creek	Indicator Bacteria
El Capitan Lake	Color, Manganese, Phosphorus, Total Nitrogen as N, pH
Encinitas Creek	Benthic Community Effects, Phosphorus, Selenium, Toxicity
Escondido Creek	Benthic Community Effects, Bifenthrin, DDT, Indicator Bacteria Malathion, Manganese, Nitrogen, Phosphate, Selenium, Sulfates, Total Dissolved Solids, Toxicity
Eucalyptus Hills Creek	Diazinon, Indicator Bacteria
Famosa Slough and Channel	Eutrophic
Felicita Creek	1,4-Dioxane, Aluminum, Indicator Bacteria, Trichloroethylene/TCE, Tetrachloroethylene/PCE, Total Dissolved Solids
Forester Creek	Benthic Community Effects, Indicator Bacteria, Nitrogen, Phosphorus, Selenium, Total Dissolved Solids
Gopher Creek	Indicator Bacteria
Green Canyon Creek	Indicator Bacteria
Green Valley Creek	Benthic Community Effects, Bifenthrin, Chloride, Chlorpyrifos, Manganese, PCP, Sulfates, Total Nitrogen as N
Guajome Lake	Eutrophic
Harbison Canyon	Indicator Bacteria
Hodges, Lake	Manganese, Mercury, Turbidity, pH, Color, Phosphorus, Nitrogen
Jamacha Creek	Indicator Bacteria
Jamul Creek	Toxicity
Keys Creek	Indicator Bacteria, Nitrogen, Selenium

Impaired Water Body	Pollutant
Kit Carson Creek	PCP, Total Dissolved Solids
La Zanja Canyon	Indicator Bacteria
Live Oak Creek (San Diego County)	Indicator Bacteria
Loma Alta Creek	Selenium, Toxicity, Benthic Community Effects
Loma Alta Slough	Eutrophic, Indicator Bacteria
Long Canyon Creek (Lower Sweetwater Watershed)	Indicator Bacteria
Long Canyon Creek (tributary to Murrieta Creek)	Phosphorus, Chlorpyrifos, Manganese, Iron, Nitrogen
Los Coches Creek	Indicator Bacteria, Nitrogen, Phosphorus, Selenium
Los Penasquitos Creek	Benthic Community Effects, Bifenthrin, Chlorpyrifos, Indicator Bacteria, Nitrogen, Phosphate, Total Dissolved Solids, Toxicity
Los Penasquitos Lagoon	Toxicity, Sedimentation/Siltation
Loveland Reservoir	Aluminum, Manganese, Dissolved Oxygen, pH
Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)	Indicator Bacteria
Mexican Canyon Creek (western tributary to Sweetwater River, Upper)	Indicator Bacteria
Mission Bay	PCBs, Mercury
Mission Bay (Area at Mouth of Rose Creek Only)	Eutrophic, Lead
Mission Bay (Area at Mouth of Tecolote Creek Only)	Eutrophic, Lead
Mission Bay at Quivira Basin	Copper
Mission Bay Shoreline, at Bahia Point	Indicator Bacteria
Mission Bay Shoreline, at Bonita Cove	Indicator Bacteria
Mission Bay Shoreline, at Bonita Cove (eastern shore)	Indicator Bacteria
Mission Bay Shoreline, at Campland	Indicator Bacteria
Mission Bay Shoreline, at De Anza Cove	Indicator Bacteria
Mission Bay Shoreline, at Enchanted Cove	Trash
Mission Bay Shoreline, at Fanual Park	Indicator Bacteria
Mission Bay Shoreline, at Leisure Lagoon	Indicator Bacteria
Mission Bay Shoreline, at Tecolote Shores	Indicator Bacteria
Mission Bay Shoreline, at Visitors Center	Indicator Bacteria
Moosa Canyon Creek	Nitrogen, Phosphorus, Indicator Bacteria
Moosa Canyon, South Fork	Indicator Bacteria
Morena Reservoir	Ammonia, Color, Manganese, Nitrogen, Phosphorus, pH
Oceanside Harbor	Toxicity, Copper
Otay Reservoir, Lower	pH, Ammonia, Color, Manganese, Iron, Phosphorus, Nitrogen
Pacific Ocean Shoreline, San Diego HU, at the San Diego River Outlet, at Dog Beach	Indicator Bacteria, Enterococcus, Total Coliform

Impaired Water Body	Pollutant
Pacific Ocean Shoreline, Scripps HA, at Children's Pool	Indicator Bacteria
Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach	Interior Bacteria, Trash
Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave	Indicator Bacteria
Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River Mouth	Indicator Bacteria
Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek Outlet	Indicator Bacteria
Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive	Indicator Bacteria
Pacific Ocean Shoreline, Tijuana HU, at the U.S. Border	Indicator Bacteria
Paleta Creek	Copper, Lead
Paradise Creek, HSA 908.320	Phosphorus, Selenium
Poggi Canyon Creek	Nitrogen, Toxicity
Poway Creek	Nitrogen, Selenium, Toxicity
Rainbow Creek	Sulfates, Total Dissolved Solids, Aluminum, Phosphorus, Nitrogen, Iron
Rose Creek	Benthic Community Effects, Selenium, Toxicity
San Diego Bay	PCBs, Mercury, PAHs
San Diego Bay Shoreline, 32nd Street San Diego Naval Station	Benthic Community Effects, Sediment Toxicity
San Diego Bay Shoreline, at America's Cup Harbor	Copper
San Diego Bay Shoreline, at Bayside Park (J Street)	Indicator Bacteria
San Diego Bay Shoreline, at Coronado Cays	Copper
San Diego Bay Shoreline, at Glorietta Bay	Copper
San Diego Bay Shoreline, at Harbor Island (East Basin)	Copper
San Diego Bay Shoreline, at Harbor Island (West Basin)	Copper
San Diego Bay Shoreline, at Marriott Marina	Copper
San Diego Bay Shoreline, between Sampson and 28th Streets	Mercury, PAHs, Copper, Zinc, PCBs
San Diego Bay Shoreline, at Spanish Landing	Total Coliform
San Diego Bay Shoreline, between Sampson and 28th Streets	Copper, Mercury, PAHs, PCBs, Zinc
San Diego Bay Shoreline, Chula Vista Marina	Copper

Impaired Water Body	Pollutant
San Diego Bay Shoreline, near Chollas Creek	Benthic Community Effects, Sediment Toxicity
San Diego Bay Shoreline, near Coronado Bridge	Benthic Community Effects, Sediment Toxicity
San Diego Bay Shoreline, Downtown Anchorage	Benthic Community Effects, Sediment Toxicity
San Diego Bay Shoreline, G Street Pier	Indicator Bacteria
San Diego Bay Shoreline, near Sub Base	Benthic Community Effects, Toxicity
San Diego Bay Shoreline, near Switzer Creek	Chlordane, PAHs
San Diego Bay Shoreline, North of 24th Street Marine Terminal	Benthic Community Effects, Sediment Toxicity
San Diego Bay Shoreline, Seventh Street Channel	Benthic Community Effects, Sediment Toxicity
San Diego Bay Shoreline, Tidelands Park	Indicator Bacteria
San Diego Bay Shoreline, Vicinity of B Street and Broadway Piers	Indicator Bacteria, Benthic Community Effects, Sediment Toxicity
San Diego Bay, Shelter Island Yacht Basin	Copper, Dissolved
San Diego River (Lower)	Indicator Bacteria, Benthic Community Effects, Cadmium, Dissolved Oxygen, Nitrogen, Phosphorus, Total Dissolved Solids, Toxicity
San Diego River (Upper)	Dissolved Oxygen, Indicator Bacteria, Sulfates
San Dieguito River, unnamed tributary below Hodges Dam	Indicator Bacteria
San Elijo Lagoon	Indicator Bacteria, Sedimentation/Siltation, Toxicity, Eutrophic
San Luis Rey River, Lower (West of I-15)	Benthic Community Effects, Bifenthrin, Chloride, Indicator Bacteria, Nitrogen, Phosphorus, Total Dissolved Solids, Total Nitrogen as N, Toxicity
San Luis Rey River, Upper (East of I-15)	Indicator Bacteria, Phosphorus, Total Nitrogen as N
San Marcos Creek	Benthic Community Effects, Indicator Bacteria, Phosphorus, Selenium, Toxicity
San Marcos, Lake, drain to central southwest fork of lake	Copper
San Marcos, Lake, drain to central southwest fork of lake	Indicator Bacteria
San Mateo Creek (San Diego County)	Indicator Bacteria, Invasive Species
San Vicente Creek	Indicator Bacteria, Ammonia as Nitrogen, Phosphorus, Total Nitrogen as N, Toxicity
San Vicente Reservoir	Chloride, Color, Sulfates, Nitrogen, pH
Sandia Creek	Aluminum, Ammonia (Unionized), Manganese, Nitrogen, Selenium, Silver, Iron, Total Dissolved Solids, Sulfates
Santa Margarita Lagoon	Eutrophic
Santa Margarita River (Lower)	Benthic Community Effects, Chlorpyrifos, Toxicity, Phosphorus, Nitrogen

Impaired Water Body	Pollutant
Santa Margarita River (Upper)	Indicator Bacteria, Iron, Manganese, Nitrogen, Phosphorus, Toxicity
Santa Ysabel Creek (above Sutherland Reservoir)	Toxicity
South Lake	Nutrients, Phosphorus, Ammonia as Nitrogen, Copper
Steele Canyon	Indicator Bacteria
Soledad Canyon	Sediment Toxicity, Selenium
Sutherland Reservoir	Color, Iron, Manganese, Nitrogen, Phosphorus, pH
Sweetwater Reservoir	Dissolved Oxygen
Sweetwater River, Lower (below Sweetwater Reservoir)	Benthic Community Effects, Chlorpyrifos, Indicator Bacteria, Nitrogen, Phosphorus, Selenium, Total Dissolved Solids, Toxicity
Sweetwater River, North Fork, unnamed tributary at Tavern Road	Manganese, Indicator Bacteria
Sweetwater River, Upper (above Sweetwater Reservoir)	Selenium, Indicator Bacteria, Aluminum, Total Nitrogen as N, Benthic Community Effects
Switzer Creek	Copper, Lead, Zinc
Sycamore Canyon	Dissolved Oxygen
Tecate Creek	Nitrogen, Phosphorus, Selenium
Tecolote Creek	Benthic Community Effects, Bifenthrin, Cadmium, Cypermethrin, Diazinon, Copper, Indicator Bacteria, Lead, Nitrogen, Phosphorus, Selenium, Toxicity, Turbidity, Zinc
Tecolote Creek, South Fork	Indicator Bacteria
Telegraph Canyon Creek	Nitrogen, Selenium
Temecula Creek	Chlorpyrifos, Copper, Indicator Bacteria, Total Dissolved Solids, Toxicity, Phosphorus
Tijuana River	Ammonia as Nitrogen, Eutrophic, Benthic Community Effects, Cadmium, Chlorpyrifos, Diazinon, Indicator Bacteria, Low Dissolved Oxygen, Malathion, Pesticides, Phosphorus, Sedimentation/Siltation, Selenium, Solids, Methylene Blue Active Substances (MBAS), Synthetic Organics, Total Nitrogen as N, Toxicity, Trace Elements, Trash
Tijuana River Estuary	Eutrophic, Indicator Bacteria, Lead, Low Dissolved, Oxygen, Nickel, Pesticides, Thallium, Trash, Toxicity, Turbidity

Source: SWRCB 2021.

Placement of a water body onto the 303(d) list requires the RWQCB to make further analysis of the impairment and develop Total Maximum Daily Loads (TMDLs) for addressing the impairment. Once a TMDL is established, it may impose conditions on development either through an implementation plan and schedule for the listed water, or through special conditions required of the jurisdiction affected by the numeric criteria of the TMDL. As of May 9, 2019, several 303(d) listed water body segments in the San Diego region are at various stages of TMDL development. SWRCB-approved TMDLs in the San Diego Hydrologic Basin are as follows:

- Dissolved copper for Shelter Island Yacht Basin, San Diego Bay (R9-2005-0019).
- Diazinon and metals for Chollas Creek (R9-2002-0123 and R9-2007-0043).
- Nutrients and phosphorus for Rainbow Creek (Resolution R9-2005-0036).

- Indicator bacteria for Shelter Island Shoreline Park in San Diego Bay (R9-2008-0027).
- Indicator bacteria for beaches and creeks in the San Diego Region (R9-2010-0001).
- Sediment for Los Peñasquitos Lagoon (Resolution R9-2012-0022).
- Phosphorus for Loma Alta Slough (R9-2014-0020)[1].

The following TMDLs are in progress as of May 2019:

- San Diego Bay marine sediment toxicity for Chollas Creek mouth, 7th Street Channel (Paleta) Creek, Switzer Creek mouth, B Street/Broadway Piers, and Downtown Anchorage (Pueblo Watershed).
- TMDLs for Impaired Lagoons, Adjacent Beaches, and Agua Hedionda Creek.
- Tijuana River and Estuary (Tijuana Watershed).
- Famosa Slough and channel (San Diego River Watershed)[1] Sedimentation/siltation for Los Peñasquitos Lagoon (Peñasquitos Watershed).
- Nutrients, bacteria, or sediments for Loma Alta Slough, Pacific Ocean Shoreline at Loma Alta Creek, Buena Vista Lagoon, Pacific Ocean shoreline at Buena Vista Creek, Lower Agua Hedionda Creek, San Elijo Lagoon, Pacific Ocean at San Elijo Lagoon Outlet, and San Marcos Creek/Lake San Marcos.
- Santa Margarita River and Estuary.[1]

FLOOD HAZARDS AND FLOOD CONTROL

The San Diego region's climate is semiarid and the seasonal precipitation is highly variable in frequency, magnitude, and location. Infrequent large bursts of rain can rush down steep canyons and flood areas unexpectedly. Flooding in the San Diego region and the rest of Southern California most frequently occurs during winter storm events between November and April, and occasionally during the summer when a tropical storm makes landfall. Most flooding events occur over several days but can also develop within a matter of hours, particularly in narrow valleys (County of San Diego 2011). However, as the San Diego region averages approximately 10 inches of rainfall annually, flooding is not frequent and usually occurs around the region's coastal lagoons and estuaries, as well as in the lower reaches of rivers and creeks near the Pacific Ocean.

Dam failure inundation is flooding caused by the release of impounded water from failure or overtopping of a dam. Areas directly below the dam are at the greatest risk, and as the water moves farther downstream and its depth decreases, the magnitude of the damage and potential risk to life and property decreases. There are 25 dams within the San Diego region; failure of any of these dams would affect downstream areas. Dam owners are required to submit inundation maps to the California Office of Emergency Services (Cal OES) for review and approval in accordance with guidance issued by Cal OES. Inundation maps submitted by dam owners are provided by the California Department of Water Resources (DWR 2018a). These inundation maps delineate dam inundation zones or the areas at risk in the event of failure for each dam. The maps represent the best

[1] The TMDL investigation indicated that non-stormwater discharges from the local watershed and the stormwater conveyance system are the primary sources of nutrients. These discharges are regulated under the existing Regional MS4 Permit, and the necessary actions to reduce nutrient loading and restore beneficial uses can be tracked through the reporting requirements of the Regional MS4 Permit. Therefore, this alternative restoration plan using the existing permit was implemented instead of adopting the TMDL as a Basin Plan amendment.

estimate of where water would flow if a dam failed completely and suddenly with a full reservoir. Cal OES provides assistance and guidance to local jurisdictions on emergency planning for dam failure events. Table 4.10-2 shows the storage of surface water reservoirs and dams within the San Diego region.

Table 4.10-2
Reservoirs with Dams in San Diego Region

Lake	Storage (acre-feet)
Maerkle	219
Dixon	2,495
Wohlford	2,054
Red Mountain	429.5
Cuyamaca	455
Jennings	8,592
Poway	3,432
Morro Hill	172
Ramona	1,310
Olivenhain – CWA	18,528
Barrett	20,500
El Capitan	30,611
Hodges	11,419
Lower Otay	36,206
Miramar	5,563
Morena	5,570
Murray	4,137
San Vicente	179,706
Sutherland	10,987
San Dieguito	457
Loveland	8,055
Sweetwater	12,396
Turner	1,507
Henshaw	6,044

Source: SDCWA 2021b.
Note: Storage amounts current as of March 11, 2021.

Flooding in the San Diego region could also occur as a result of a failure of a levee. Levee Flood Protection Zone (LFPZ) maps were developed by the DWR to increase awareness of flood risks associated with State-federal levees. LFPZ maps estimate the maximum area that may be flooded if a levee fails with flows at maximum capacity that may reasonably be conveyed. No areas in the San Diego region are in a levee flood protection zone (DWR 2018b).

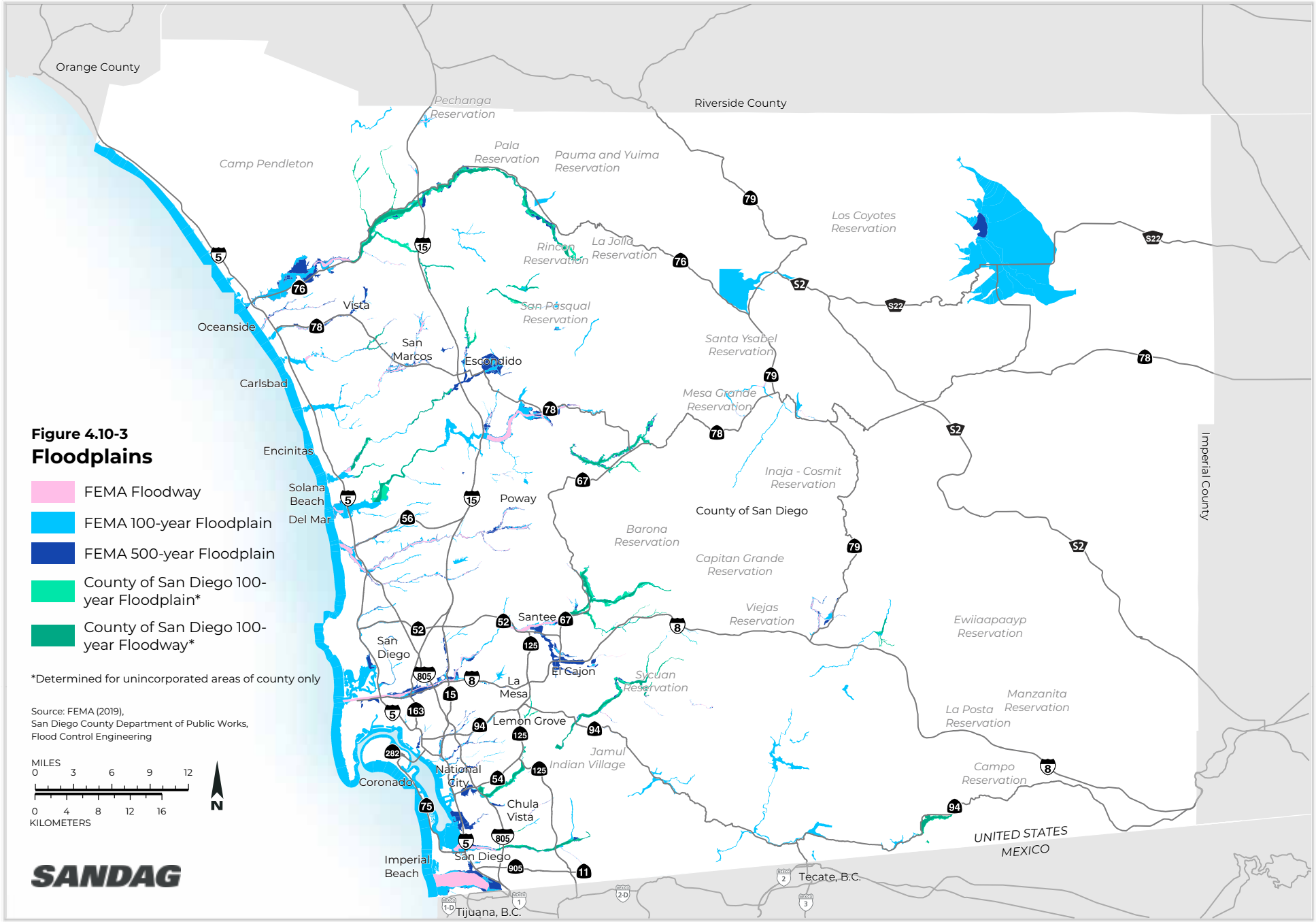
The Federal Insurance Rate Map (FIRM) is the official map created and distributed by the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program (NFIP). The FIRM delineates Special Flood Hazard Areas (SFHAs): areas subject to inundation by the base flood (i.e., the flood having a 1 percent chance of being equaled or exceeded in any given year; the 100-year flood), for every county and community

that participates in the NFIP, including those in the San Diego region. FIRMs contain flood risk information based on historic, meteorological, hydrologic, and hydraulic data, as well as open-space conditions, flood control works, and development. Figure 4.10-3 shows FEMA floodway and floodplain areas for the San Diego region, as well as 100-year and 500-year flood zones (i.e., flood having a respective 1 and 0.2 percent chance of being equaled or exceeded in any given year). A floodway is any water channel and adjacent land areas necessary to convey floodwaters, and a floodplain includes the floodway and any land area susceptible to being inundated by floodwaters (FEMA 2011, 2020). In addition to the FEMA FIRMs, the County of San Diego has developed its own flood maps that account for additional areas of known risk. The County of San Diego flood maps delineate 1 percent annual chance (100-year) riverine flood boundaries and elevations for areas not studied by FEMA. The County of San Diego Mapping Program has mapped miles of rivers and streams in the unincorporated area

Seiches and Tsunamis

A seiche is an earthquake or wind-induced wave in a confined body of water such as a lake, bay, or reservoir. Waves can be up to tens of feet high. Lakes, bays, and reservoirs that could experience a seiche are shown in Figure 4.10-1. There is no historical precedence for large damaging seiches in the San Diego region (SANDAG 2015).

Tsunamis are long-period sea waves generated by an abrupt movement of large volumes of water. These waves can be caused by underwater earthquakes, landslides, volcanic eruptions, meteoric impacts, or onshore slope failures. Seismic conditions and fault zones within the San Diego region are discussed in Section 4.7, *Geology, Soils, and Paleontological Resources*. The California Department of Conservation (2013) provides detailed maps showing the areas of inundation from tsunamis for the San Diego region that are used to determine whether a project footprint lies within the limits of inundation. These maps are developed for all populated areas at risk to tsunamis in California, and represent a combination of the maximum considered tsunamis for each area.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.
Figure 4.10-3
Floodplains
FEMA Floodway
FEMA 100-year Floodplain
FEMA 500-year Floodplain
County of San Diego 100-year Floodplain*
County of San Diego 100-year Floodway*
*Determined for unincorporated areas of county only
Source: FEMA (2019), San Diego County Department of Public Works, Flood Control Engineering
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Maps are available by quadrangle for each affected coastal area/community within the San Diego region: Del Mar, Encinitas, Imperial Beach, La Jolla, National City, Oceanside-San Luis Rey, Point Loma, and San Onofre Bluff. Tsunami hazards would be limited to the lower shoreline elevations along the Pacific coast, San Diego Bay, Mission Bay, and the five coastal lagoons. The risk of tsunamis in the San Diego region is low. In 92 years of record, at least 19 tsunamis have been recorded in the San Diego region, with most only a few tenths of a meter in height. The largest tsunami, caused by the Chilean earthquake in 1960, produced waves 1.5 meters in height causing damage to piers (Agnew 2009). The San Diego region has only experienced one tsunami caused by a local earthquake, which occurred in 1862 (Agnew 2009).

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

Climate change threats to hydrology and water quality mainly include risks from flooding and changes in precipitation patterns. The San Diego region is likely to experience sea-level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, as well as wetter winters and more intense precipitation that can lead to increased flooding (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix C.

Climate change could alter the hydrology in the San Diego region. CEP and SDF (2015) projects longer and more intense droughts, fewer rainy days, and more rainfall during the biggest rainstorms by 2050. These changes increase flooding to the region, which could lead to impacts on drainage, such as more soil erosion, mudflow, and landslides (County of San Diego 2018). Due to less snowpack and more evaporation, the San Diego region expects to see a decrease in runoff and streamflow. Thus, climate change may have a negative impact on hydrology in the San Diego region.

Climate change can also worsen water quality in a variety of the region's water resources through increased nonpoint water pollution during severe storm events, saltwater intrusion resulting from sea-level rise, sediments from increased incidence of wildfires, and higher temperatures. Heavier storms may decrease both beach and surface water quality because rainfall can cause runoff from nonpoint sources of contamination—such as trash, fertilizers, sediments, metals, sewage, and other fluids—which then drain into the ocean and streams. As a result, California health officials recommend that people stay out of beach waters for at least 3 days following rain events of at least 0.1 inch. In 2017–2018, beaches in San Diego County faced two beach closures and ten health warnings, and 24 sewage spills (totaling 187,001 gallons) reached a water body (Heal the Bay 2018). More intense rainstorms from climate change may worsen this hazardous runoff; the San Diego region may see 8 percent more precipitation during its heaviest storms (CEP and SDF 2015). Climate change could cause these incidents to increase in frequency or severity, although the extent to which that could occur has not been quantified. Along the coast, saltwater intrusion from sea-level rise can infiltrate groundwater, worsening the quality of this freshwater resource. Projected increases in wildfires across the region may also worsen water quality for surface waterways by increasing sediment flows (Meixner and Wohlgemuth 2004). Also, higher temperatures may alter rates of stratification in lakes, potentially removing dissolved oxygen and leading to excess nutrients in lakes (Melillo et al. 2014). These higher temperatures may also reduce general water quality by changing water chemistry and promoting growth of bacteria (Duran-Encalada et al. 2017), algae, and parasites (Major et al. 2011). However, the available literature has not quantified the extent to which this would affect water quality in the San Diego region.

4.10.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Clean Water Act

The federal CWA (33 USC Section 1251 et seq.) of 1972 is the basic federal law that addresses surface water quality control and protection of beneficial uses of water. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters through prevention, reduction, and elimination of pollution. The CWA applies to discharges of pollutants into waters of the U.S. The CWA establishes a framework for regulating stormwater discharges from municipal, industrial, construction, and other activities under National Pollutant Discharge Elimination System (NPDES) regulations. In California, the SWRCB administers the NPDES program. The following CWA sections are most relevant to regulation of surface water in the San Diego region.

Section 303(d) Total Maximum Daily Loads and Water Quality Standards

Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop a list of water quality–limited segments. Waters on the 303(d) list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that states, territories, and authorized tribes establish priority rankings for water bodies on the 303(d) list and develop action plans (i.e., TMDLs) to improve water quality. As defined by the CWA, water quality standards consist of four elements:

- Designated beneficial uses of water bodies
- Water quality criteria to protect designated uses
- An anti-degradation policy to maintain and protect existing uses and high quality waters
- General policies addressing implementation issues

Under CWA Section 303(d) (33 USC Section 1313[d]), states, territories, and authorized tribes are required to develop a list of water bodies that are considered to be "impaired" from a water quality standpoint. Water bodies that appear on this list either do not meet or are not expected to meet water quality standards, even after the minimum required levels of pollution control technology have been implemented to reduce point-source discharges. The law requires that respective jurisdictions establish priority rankings for surface water bodies on the list and develop action plans (TMDLs) to improve water quality. A TMDL is a calculation of the maximum amount of a specific pollutant that a water body can receive and still meet federal water quality standards as provided in the CWA (EPA 2017). TMDLs account for all sources of pollution, including point sources, nonpoint sources, and natural background sources.

The CWA Section 303(d) list of impaired water bodies provides a prioritization and schedule for development of TMDLs for states. The SWRCB, in compliance with CWA Section 303(d), publishes the list of water quality-limited segments in California, which includes a priority schedule for development of TMDLs for each contaminant or "stressor" affecting the water body (SWRCB 2015a).

Section 401 – Water Quality Certification

Every applicant for a federal permit or license for any activity that may result in a discharge to a water body must obtain a CWA Section 401 (33 USC Section 1341) Water Quality Certification for the proposed activity and

must comply with state water quality standards prescribed in the certification. The SWRCB and RWQCBs are responsible for issuing Section 401 Water Quality Certifications. Most certifications are issued in connection with CWA Section 404 U.S. Army Corps of Engineers (USACE) permits for dredge and fill material discharges.

Section 402 – NPDES Program

CWA Section 402 (33 USC Section 1342) sets forth regulations that prohibit the discharge of pollutants into waters of the U.S. from point or nonpoint sources without first obtaining an NPDES Permit. The SWRCB and nine RWQCBs administer the NPDES Permit program. The SWRCB implements the NPDES and the state's water quality programs by regulating discharges of pollutants to surface waters to protect their beneficial uses. To comply with the CWA water quality regulations, nine RWQCBs in California develop and enforce water quality objectives and implementation plans, issue Waste Discharge Requirements (WDRs) that integrate NPDES permit requirements, take enforcement action, and monitor water quality within their hydrologic areas.

To regulate runoff-related (nonpoint source) discharges, the SWRCB developed a variety of general NPDES Permits for controlling industrial, construction, and municipal stormwater discharges (general permits for each category described separately under *State Laws, Regulations, Plans, and Policies*, below). Stormwater discharges are permitted under the NPDES program. Section 402(p) of the CWA requires that municipal Stormwater Management Programs be developed and implemented for municipalities to meet the requirements for stormwater discharges from municipal permits. Stormwater Management Programs limit, to the maximum extent practicable, the discharge of pollutants from storm sewer systems. A single agency or a coalition, often consisting of more than one municipality (such as cities and counties), may implement these programs. Each program includes best management practices (BMPs) intended to reduce the quantity and improve the quality of stormwater discharged to the stormwater system. Discharges to storm sewer systems must comply with the Stormwater Management Program's requirements.

Section 404 – Discharge of Dredge or Fill Material

CWA Section 404 (33 USC Section 1344) establishes a permit program, administered by USACE with EPA oversight, regulating discharge of both dredged and/or fill materials into waters of the U.S. (as defined at 33 CFR 328.3(a), including wetlands. *Dredged material* means material that is excavated or dredged from waters of the U.S. *Fill material* means material placed in waters of the U.S. where the material has the effect of replacing any portion of a waters of the U.S. with dry land or changing the bottom elevation of waters of the U.S. Examples of fill material include rock, sand, soil, clay, plastics, woodchips, concrete, and materials used to create any structure or infrastructure in waters of the U.S. Activities in waters of the U.S. that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. Under CWA Section 404(e), USACE can issue general permits to authorize activities that have minimal individual and cumulative adverse environmental effects. General permits can be issued for a period of no more than 5 years. USACE can issue nationwide permits, which is a general permit that authorizes activities across the country, unless revoked by a district or division commander. Nationwide permits authorize a wide variety of activities such as linear transportation projects, residential development, commercial and industrial developments, utility lines, road crossings, bank stabilization activities, wetland and stream restoration activities, and certain maintenance activities. Four new nationwide permits were added in 2021. Two of the four provide appropriate mechanisms for an efficient process to authorize structures in navigable waters for finfish and seaweed mariculture activities. The other two provide appropriate processes to enable project proponents to obtain authorization to discharge dredged or fill material or to construct structures or do work in regulated waters associated with the construction and maintenance of electric utility

lines and telecommunication activities or with the construction and maintenance of utility lines for water or other substances. (USACE 2021).

Section 10 of the Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act, administered by USACE, prohibits the creation of any obstruction, excavation, or fill, or any alteration or modification of any navigable water of the U.S. unless the work has been permitted by USACE (33 USC Section 403). Permits for activities including excavation and dredging or deposition of material, or any obstruction or alteration to a navigable water which could impact water quality, are regulated under both Section 404 (CWA) and Section 10 (Rivers and Harbors Act), and are processed simultaneously by the USACE.

Federal Antidegradation Policy

The federal antidegradation policy (40 CFR Section 131.12) has been in existence since 1968. The policy protects existing uses, water quality, and national water resources. It directs states to adopt a statewide policy that includes the following primary provisions:

- Maintain and protect existing instream uses and the water quality necessary to protect those uses.
- Where existing water quality is better than necessary to support fishing and swimming conditions, maintain and protect water quality unless the state finds that allowing lower water quality is necessary for important local economic or social development.
- Where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, maintain and protect that water quality.

Executive Order 11988 – Floodplain Management

An amendment to Executive Order (EO) 11988 was issued on January 28, 2015, and includes revised guidelines for implementing EO 11988. Amended EO 11988 directs federal agencies to avoid, to the extent practicable and feasible, short- and long-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever a practicable alternative exists. Each federal agency is responsible for reducing the risk of flood loss, minimizing the impact of floods on human safety, health, and welfare, and restoring and preserving natural and beneficial values served by flood plains. In addition, amended EO 11988 advises agencies to use a higher flood elevation and expanded flood hazard area than the base flood previously described in EO 11988 to ensure that climate change and other future changes are more adequately accounted for in agency decisions.

National Flood Insurance Act of 1968

The National Flood Insurance Act of 1968 established the NFIP. The NFIP is a federal program administered by the Flood Insurance Administration of the FEMA. It enables individuals who have property within the 100-year floodplain to purchase insurance against flood losses. Community participation and eligibility, flood hazard identification, mapping, and floodplain management aspects are administered by state and local programs and support directorate within FEMA. FEMA works with the states and local communities to identify flood hazard areas and publishes a flood hazard boundary map of those areas.

The basic tools for regulating construction in potentially hazardous floodplain areas are local zoning techniques and FEMA floodplain mapping. FIRM is the official map created and distributed by FEMA and the NFIP that delineates SFHAs—areas that are subject to inundation by a base flood—for every county and community that participates in the NFIP. FIRMs contain flood risk information based on historic, meteorological, hydrologic, and hydraulic data, as well as open-space conditions, flood control works, and development. For projects that would affect the hydrologic or hydraulic characteristics of a flooding source and modify an existing regulatory floodway, effective Base Flood Elevations, or an SFHA, a conditional letter of map revision would need to be approved by FEMA.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

California Ocean Plan

The California Ocean Plan (SWRCB 2015) implements standards for ensuring consistency between water quality control plans and policies. In the adoption and amendment of water quality control plans, each plan provides for the attainment and maintenance of the water quality standards of downstream waters. To the extent there is a conflict between a provision of the California Ocean Plan and a provision of another statewide plan or policy, or a regional water quality control plan (basin plan), the more stringent provision shall apply except where pursuant to Chap. III.J of the California Ocean Plan (SWRCB 2015).

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act; Water Code Section 13000 et seq.) implements and augments federal protections under the CWA via regulation of the waters of the state, which include surface, ground, and ocean water as well as point sources and nonpoint sources.

The Porter-Cologne Act is California's comprehensive water quality control law and is a complete regulatory program, designed to protect water quality and beneficial uses of the state's waters. It requires the nine RWQCBs to adopt water quality control plans (basin plans) for watersheds within their regions. These basin plans are reviewed triennially and amended as necessary by the RWQCBs.

Each basin plan establishes water quality standards for specified surface waters and groundwater, which consist of beneficial uses and water quality objectives. Water quality objectives may be numeric or narrative

Where waste discharges could affect the quality of the waters of the state, the discharger must obtain a WDR permit. The SWRCB and RWQCBs have issued General WDRs governing certain categories of discharges. WDRs typically include effluent limitations, monitoring, and plan submittals that are to be implemented for protecting water quality.

State Antidegradation Policy (Resolution 68-16)

The State's antidegradation policy restricts degradation of surface and ground waters. This policy protects water bodies where existing quality is higher than necessary for the protection of beneficial uses. The State policy establishes two conditions that must be met before the quality of high-quality waters may be lowered by waste discharges.

1. The State must determine that lowering the quality of high-quality waters:
    - Will be consistent with the maximum benefit to the people of the state,

- Will not unreasonably affect present and anticipated beneficial uses of such water, and
- Will not result in water quality less than that prescribed in State policies (e.g., water quality objectives in Water Quality Control Plans).

2. Any activities that result in discharges to high-quality waters are required to:

    - Meet WDRs that will result in the best practicable treatment or control of the discharge necessary to avoid pollution or nuisance, and
    - Maintain the highest water quality consistent with the maximum benefit to the people of the state.

The discharge would not be allowed under Resolution 68-16 if the discharge, even after treatment, would unreasonably affect beneficial uses or would not comply with applicable provisions of water quality control plans.

Cobey-Alquist Flood Plain Management Act

The Cobey-Alquist Flood Plain Management Act (Water Code Sections 8400 et seq.) encourages local governments to plan, adopt, and enforce land use regulations to accomplish floodplain management, in order to protect people and property from flooding hazards. This act also provides State financial assistance for flood control projects.

California Fish and Game Code Section 1602

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by the California Department of Fish and Wildlife (CDFW), pursuant to the Fish and Game Code Section 1602.

Under Section 1602, it is unlawful for any person, governmental agency, or public utility to do the following without first submitting a complete Notification of Lake or Streambed Alteration to CDFW:

- Substantially divert or obstruct the natural flow of, or substantially change or use any material from, the bed, channel, or bank of any river, stream, or lake.
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The regulatory definition of a stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation. CDFW's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. A Lake or Streambed Alteration Agreement must be obtained from CDFW for any activity that may substantially adversely affect an existing fish or wildlife resource.

Municipal Stormwater Permit

Section 402(p) of the CWA requires that stormwater discharges are permitted under the NPDES program for Municipal Separate Storm Sewer Systems (MS4s). As part of the NDPES MS4 Permit process, Stormwater Management Programs must be developed and implemented for municipalities to meet the requirements for stormwater discharges listed in MS4 permits. Stormwater Management Programs limit, to the maximum extent practicable, the discharge of pollutants from storm sewer systems. A single State agency or a coalition, often

consisting of more than one municipality (such as cities and counties), may implement these programs. Each program includes BMPs intended to reduce the quantity and improve the quality of stormwater discharged to the stormwater system. Discharges to storm sewer systems must comply with the Stormwater Management Program's requirements.

In 1990, the EPA promulgated regulations establishing NPDES regulations for MS4s serving "medium" and "large" MS4s of 100,000 population or greater. These regulations, known as Phase I regulations, require operators of medium and large MS4s to obtain and comply with NPDES stormwater permits to reduce or eliminate the discharge of pollutants.

On December 8, 1999, EPA promulgated regulations, known as Phase II regulations, requiring operators of small MS4s to obtain and comply with NPDES stormwater permits for small MS4s under the authority of the CWA section 402(p)(6). On February 5, 2013, the SWRCB adopted Water Quality Order No. 2013-0001-DWQ, NPDES General Permit No. CAS000004 (as amended by Orders 2015-0133_EXEC, WQ 2016-0069-EXEC, WQ 2018-0001-EXEC, and 2018-0007-EXEC), Waste Discharge Requirements for Storm Water Discharges from Small MS4 (Phase II General Permit) to comply with CWA section 402(p)(6). The Phase II General Permit became effective on July 1, 2013.

In compliance with this requirement, the county and cities in San Diego County developed Stormwater Management Programs, which are discussed in more detail under *Regional and Local Laws, Regulations, Plans, and Policies*, below.

California Department of Transportation NPDES Permit

Under the California Department of Transportation (Caltrans) statewide NPDES permit (Order 2012-0011-DWQ, as amended by Order WQ 2014-0006-Exec, Order WQ 2014-0077-DWQ, and Order WQ 2015-0036-Exec), Caltrans is required to regulate nonpoint-source discharges from its properties, facilities, and activities (SWRCB 2012b), such as the following.

- Stormwater discharges from all Caltrans-owned municipal separate stormwater sewer systems.
- Stormwater discharges from Caltrans' vehicle maintenance, equipment cleaning, and operations facilities, and any other nonindustrial facilities with activities that have the potential to generate significant quantities of pollutants.
- Certain categories of non-stormwater discharges, as listed under Provision B in Order 2012- 0011-DWQ.

Order 2012-0011-DWQ does not regulate stormwater discharges from Caltrans-owned batch plants or any other industrial facilities. Caltrans must obtain coverage for stormwater discharges associated with industrial activities under the Statewide Industrial General Permit for these discharges, and must comply with the applicable requirements. Although Order 2012-0011-DWQ does not regulate stormwater discharges associated with industrial activities, it does impose contractor requirements for certain industrial facilities.

Order 2012-0011-DWQ also does not regulate discharges from Caltrans construction activities, including dewatering effluent discharges from construction projects. Instead, Caltrans must obtain coverage for stormwater discharges associated with construction activities under Order 2009-0009-DWQ (as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ), the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (SWRCB 2009).

Construction General Permit

Dischargers whose projects disturb 1 or more acres of soil, or less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the SWRCB's Order 2009-0009-DWQ (as amended by Orders 2010-0014-DWQ and 2012- 0006-DWQ), the Construction General Permit (SWRCB 2009). Construction and demolition activities subject to this permit include clearing, grading, grubbing, and excavation, or any other activity that results in a land disturbance equal to or greater than one acre.

Permit applicants are required to submit a Notice of Intent to the SWRCB and to prepare a Storm Water Prevention Pollution Plan (SWPPP). The SWPPP must identify BMPs that are to be implemented to reduce construction impacts on receiving water quality based on potential pollutants. The SWPPP also must include descriptions of the BMPs to reduce pollutants in stormwater discharges after all construction phases are completed at a site (post-construction BMPs). The Construction General Permit also includes requirements for risk-level assessment for construction sites, a stormwater effluent monitoring and reporting program, rain event action plans, and numeric action levels for pH and turbidity.

Industrial General Permit

Industrial facilities are subject to the requirements of SWRCB Water Quality Order 2014-0057-DWQ (as amended by Order 2015-0122-DWQ), NPDES General Permit for Storm Water Discharges Associated with Industrial Activities Excluding Construction Activities (Industrial General Permit). These regulations prohibit discharges of industrial stormwater to waters of the U.S. and state from a broad range of industrial activities, including mining, manufacturing, disposal, recycling, and transportation, unless such discharges comply with a site-specific NPDES permit. On April 1, 2014, the SWRCB adopted Order 2014-0057-DWQ, with an effective date of July 1, 2015.

Special Protections for Areas of Special Biological Significance

On March 20, 2012, the SWRCB approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to ASBS for certain nonpoint source discharges and NPDES-permitted municipal stormwater discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storm discharges into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal stormwater discharges to the San Diego Marine Life Refuge in La Jolla are subject to terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections are contained in Attachment B to Resolution No. 2012-0012.

California Coastal Act

Section 30231 of the California Coastal Act establishes a policy of maintaining and restoring the biological productivity and water quality of coastal waters, streams, wetlands, estuaries, and lakes within the Coastal Zone. Section 30236 addresses flood control projects for the protection of existing structures in the floodplain. Section 30253, part (a) establishes a policy that that new development must minimize risks to life and property in areas of high flood hazard.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

San Diego Regional Water Quality Control Board

As described above, the Porter-Cologne Act requires that RWQCBs adopt water quality control plans (basin plans) for watersheds within their jurisdiction. These plans establish water quality standards for particular surface water bodies and groundwater resources.

The San Diego RWQCB (Region 9), a State agency, is responsible for the basin plan for the San Diego Basin. The RWQCB implements management plans to modify and adopt standards under provisions set forth in Section 303(c) of the CWA and California Water Code (Division 7, Section 13240). In addition to basin plan requirements, the RWQCB issues water quality certifications under CWA Section 401. The RWQCB also regulates discharges to surface waters and groundwater through the issuance of WDRs. WDRs are issued for discharges that specify limitations relative to the Basin Plan (San Diego RWQCB 2016).

2019 Final San Diego Integrated Regional Water Management Plan

The Final 2019 San Diego Integrated Regional Water Management (IRWM) Plan (San Diego IRWM Program 2019) was prepared under the direction of a Regional Water Management Group consisting of the San Diego County Water Authority, the County of San Diego, and the City of San Diego. The IRWM Plan builds on local water and regional management plans within the San Diego region and is aimed at developing long-term water supply reliability, improving water quality, and protecting natural resources. The Statewide IRWM Program is supported by bond funding provided by DWR to fund competitive grants for projects that improve water resources management. IRWM Plan goals are to:

- Improve the reliability and sustainability of regional water supplies.
- Protect and enhance water quality.
- Protect and enhance our watersheds and natural resources.
- Enhance resiliency to climate change for local water resources.
- Promote and support sustainable integrated water resource management.

Water Quality Control Plan for the San Diego Basin (Basin Plan)

The preparation and adoption of basin plans is required by the California Water Code (Section 13240) as prescribed by the CWA. According to Section 13050 of the Water Code, basin plans include designation or establishment of beneficial uses to be protected, water quality objectives to protect those uses, and a program of implementation needed for achieving the objectives for the waters within a specified area. Basin plans satisfy both State and federal regulatory requirements for water quality control.

Water Quality Objectives

The San Diego RWQCB Basin Plan sets narrative and numerical water quality objectives that must be attained or maintained to protect beneficial uses and conform to the State's antidegradation policy. The water quality objectives are the levels of water quality constituents that must be met to protect the beneficial uses (San Diego RWQCB 2016). Table 4.10-3 includes a summary list of these water quality constituents that received narrative or numerical concentration objectives. A complete and detailed list of water quality objectives can be found in

the Basin Plan. Each water quality constituent may result in varied objectives conditional on the beneficial use of the waters.

Table 4.10-3
Water Quality Constituents

Bacteria – Total coliform, fecal coliform, E. Coli, and enterococci	pH
Biostimulatory Substances	Phenolic Compounds
Boron	Radioactivity
Chlorides	Secondary Drinking Water Standards[2]
Color	Sediment
Dissolved Oxygen	Sodium
Floating Material	Sulfate
Fluoride	Suspended and Settleable Solids
Inorganic Chemicals[1]	Tastes and Odors
Iron	Temperature
Manganese	Total Dissolved Solids
Methylene Blue–Activated Substances	Toxicity
Nitrate	Toxic Pollutants[3]
Oil and Grease	Trihalomethanes
Organic Chemicals	Turbidity
Pesticides	Un-Ionized ammonia

Source: San Diego RWQCB 2016.
[1] Waters designated for use as domestic or municipal supply (MUN) cannot contain concentrations of inorganic chemicals in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22, Table 64431-A of Section 64431 (Inorganic Chemicals), which is incorporated by reference into the Basin Plan. Inorganic chemicals include aluminum, antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrate+nitrite, nitrite, selenium, and thallium.
[2] Water designated for use as domestic or MUN cannot contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in / 64449-A of Section 64449 of Title 22 of the California Code of Regulations (Secondary Maximum Contaminant Levels, Consumer Acceptance Limits), which is incorporated by reference into the Basin Plan. Includes aluminum, color, copper, corrosivity, foaming agents, iron, manganese, methyl tert-butyl ether (MTBE), odor threshold, silver, thiobencarb, turbidity and zinc.
[3] EPA promulgated a final rule prescribing water quality criteria for toxic pollutants in inland surface waters, enclosed bays, and estuaries in California on May 18, 2000 (The California Toxics Rule or "CTR" [40 CFR 131.38]). CTR criteria constitute applicable water quality criteria in California. In addition to the CTR, certain criteria for toxic pollutants in the National Toxics Rule [40 CFR 131.36] constitute applicable water quality criteria in California as well. The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to CWA Section 303(d). A TMDL has been adopted to address this impairment.

San Diego Regional Municipal Storm Water Permit

The San Diego Regional Municipal Storm Water Permit (Order R9-2013-0001 [as amended by Order No. R9-2015-0001 and R9-2015-0100]) (Municipal Permit) regulates the conditions under which stormwater and non-stormwater discharges into and from MS4s are prohibited or limited. The 18 cities, County of San Diego government, ~~County of~~ San Diego County Regional Airport Authority, and San Diego Unified Port District each owns or operates an MS4, through which it discharges stormwater and non-stormwater into waters of the U.S. within the San Diego region. These entities are the County of San Diego Copermittees (Copermittees) which, along with the applicable Orange County and Riverside County Copermittees, are subject to the requirements of the permit. The Caltrans stormwater system is regulated separately under the Caltrans NPDES permit.

The Municipal Permit is a framework for protecting water quality and designated beneficial uses of waters of the state from adverse impacts resulting from MS4 discharges. The Municipal Permit requires that each jurisdiction covered under the permit implement a Jurisdictional Urban Runoff Management Program to control the contribution of pollutants to and the discharges from the MS4. The goal of the jurisdictional runoff management programs is to implement water quality improvement strategies and runoff management programs that effectively prohibit non-stormwater discharges into the Copermittees' MS4s and reduce pollutants in stormwater discharges from the Copermittees' MS4s to the maximum extent practicable.

The Municipal Permit requires that the Copermittees develop a Water Quality Improvement Plan for each of ten Watershed Management Areas in the San Diego region. These plans identify the highest priority water quality conditions within each watershed and specific goals, strategies, and schedules to address those priorities, including numeric goals and action levels, and requirements for water quality monitoring and assessment. The Copermittees implement strategies through their jurisdictional runoff management programs to achieve the goals of the Water Quality Improvement Plans.

In accordance with the provisions of the Municipal Permit, the County of San Diego developed a BMP Design Manual (County of San Diego 2019) to identify design requirements and related post-construction requirements to protect stormwater quality for new development and significant redevelopment within the incorporated cities and unincorporated areas of the San Diego region. The BMP Design Manual establishes a series of source control, site design, and treatment control BMPs that are to be implemented by all Priority Development Projects (PDPs). PDPs include new development, redevelopment projects that create, add, or replace 5,000 square feet, and pollutant generating projects. A PDP should refer to the local agency that has jurisdiction for the project for guidance on the source control, site design, and treatment control BMPs for stormwater pollutants. All future projects implementing the proposed Plan must adhere to these regulations.

Under the Municipal Permit, Copermittees are required to implement stormwater management requirements and controls, which include construction and post-construction requirements for stormwater BMPs. These requirements include implementing low impact development (LID) BMPs for development and significant redevelopment to reduce pollutants in stormwater runoff from sites through more natural processes such as infiltration and biofiltration.

The County of San Diego developed an LID handbook for guidance in the BMP selection process (County of San Diego 2014), which integrates current research on LID implementation in the San Diego region. Design techniques include minimizing impervious areas, conserving natural areas, and utilizing vegetation and landscaping for water quality treatment benefits.

Copermittees are also required to comply with hydromodification management requirements to mitigate the potential for increased erosion due to increased runoff rates and durations caused by development and increased impervious surfaces. The Municipal Permit requires Copermittees to implement Hydromodification Management Requirements to manage increases in runoff discharge rates and durations from PDPs to minimize erosion of channel beds and banks, sediment pollutant generation, or other impacts on beneficial uses and stream habitat. The Hydromodification Management Requirements are found Chapter 6 in the BMP Design Manual. The Hydromodification Management Requirements require PDPs to implement hydrologic control measures so that post-project runoff flow rates and durations do not exceed pre-development flow rates and durations.

Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems

On June 19, 2012, the SWRCB adopted Resolution No. 2012-0032, adopting the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of OWTS Policy. This Policy establishes a statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements and sets the level of performance and protection expected from OWTS (SWRCB 2012).

In accordance with Water Code Section 13290 et seq., the Policy sets standards for OWTS that are constructed or replaced, that are subject to a major repair, that pool or discharge waste to the surface of the ground, and that have affected, or will affect, groundwater or surface water to a degree that makes it unfit for drinking water or other uses, or cause a health or other public nuisance condition. The OWTS Policy also includes minimum operating requirements for OWTS that may include siting, construction, and performance requirements; requirements for OWTS near certain waters listed as impaired under Section 303(d) of the Clean Water Act; requirements authorizing local agency implementation of the requirements; corrective action requirements; minimum monitoring requirements; exemption criteria; requirements for determining when an existing OWTS is subject to major repair; and a conditional waiver of waste discharge requirements.

On April 15, 2015, the San Diego RWQCB adopted a Basin Plan amendment that changed water quality objectives for nitrate in groundwater basins. The Basin Plan Amendment also incorporates the State Water Quality Control Policy for Siting, Designing, Operation, and Maintenance of Onsite Wastewater Treatment Systems and made updates related to implementation of waste discharge requirements and adopted resolutions (Gorham 2015). The Basin Plan Amendment incorporates the OWTS Policy into the Basin Plan and amends the criteria to be used by the San Diego Water Board and local agencies to regulate OWTS in the San Diego region (San Diego RWQCB 2015).

Metropolitan Transit System

Metropolitan Transit System (MTS) is regulated under Resolution No. R9-2017-0006 for compliance with SWRCB Order 2013-0001-DWQ NPDES Permit No. CAS000004 (February 8, 2017). MTS was established as a special district in California and is authorized to operate public mass transit within the Cities of Chula Vista, Coronado, El Cajon, Imperial Beach, La Mesa, Lemon Grove, National City, Poway, San Diego, and Santee, as well as the unincorporated areas of the County of San Diego not served by the North County Transit District (NCTD). In accordance with the Resolution, the San Diego RWQCB requested an Amendment to include MTS as a Non-traditional Small MS4. MTS applied for coverage under the Phase II General Permit. The SWRCB adopted Order WQ 2018-007-EXEC amending WQ Order 2013-0001-DWQ on March 13, 2018 to add MTS as a non-traditional permittee.

North County Transit District

NCTD has been regulated under SWRCB Water Quality Order No. 2013-0001-DWQ NPDES Permit No. CAS000004 since July 1, 2013. The jurisdiction boundary of the permit extends from the southern Orange County border on Marine Corps Base Camp Pendleton (Mile Post [MP] 207.4) to south Del Mar (MP 245.7). MTS owns the City of San Diego portion of the rail corridor in San Diego County from MP 245.7 to MP 267.5, including the San Diego trolley light rail and bus system. The Stormwater Management Plan serves as the stormwater compliance document for all of the NCTD right-of-way, maintenance facilities, transit stations, and centers. All projects that create and/or replace between 2,500 and 5,000 square feet of impervious surface must implement one or more site design measures. NCTD regulates all development projects that create and/or replace 5,000

square feet or more of impervious surface (Regulated Projects). NCTD requires these Regulated Projects to implement measures for site design, source control, runoff reduction, stormwater treatment, and baseline hydromodification management as defined in this MS4 General Permit.

Dewatering Permit

Discharges from specified groundwater extraction activities (such as construction dewatering) must be permitted either by the San Diego RWQCB under the General Order R9-2015-0013 for groundwater waste discharges to surface waters, or authorized by the agency with jurisdiction if discharged to an MS4. Discharge via either of these mechanisms must meet applicable water quality objectives, constituent limitations, and pretreatment requirements.

County of San Diego Multi-jurisdictional Hazard Mitigation Plan

The federal Disaster Mitigation Act of 2000 requires all local governments to create a disaster plan in order to qualify for hazard mitigation funding. The Multi-Jurisdictional Hazard Mitigation Plan is a countywide plan that identifies risks and ways to minimize damage by natural and human-made disasters. The plan is a comprehensive resource document that serves many purposes such as enhancing public awareness, creating a decision tool for management, promoting compliance with State and federal program requirements, enhancing local policies for hazard mitigation capability, and providing inter-jurisdictional coordination.

Each of the 18 cities in the County participated in the planning process, as well as the Alpine Fire Protection District, Rancho Santa Fe Fire Protection District, and Padre Dam Municipal Water District. Based on its review of jurisdictional-level hazard maps, the central and eastern portions of San Diego County are most susceptible to flash floods where mountain canyons, dry creek beds, and high deserts are the prevailing terrain. In regions such as San Diego, without extended periods of below-freezing temperatures, floods usually occur during the season of highest precipitations or during heavy rainfalls after long dry spells (County of San Diego, 2017).

Approximately 134,000 people may be at risk from the 100-year flood hazard. In addition, special populations at risk that may be impacted by the 100-year flood hazard in San Diego County include 8,424 low-income households and 15,144 elderly persons. Approximately 215,000 people are at risk from the 500-year flood hazard. In addition, special populations at risk that may be impacted by the 500-year flood hazard in San Diego County include 13,689 low-income households and 24,316 elderly persons (County of San Diego, 2017).

County of San Diego Floodplain Management Plan

The County of San Diego Floodplain Management Plan (FMP) (County of San Diego 2007) assesses the flooding hazards within the unincorporated areas of the County of San Diego, summarizes current County of San Diego programs, describes potential mitigation strategies, and presents a plan for future action. It was prepared with input from County residents, responsible officials, and consultants, and with the support of the State of California Office of Emergency Services and Security and the Federal Emergency Management Agency. The FMP discusses a series of flood hazard issues and presents follow-up actions and recommendations for risk reduction. Based on the findings and recommendations in each of these areas, the County developed a Mitigation Action Plan (MAP). The County's Hazard MAP identifies mitigation activities, the priority assigned to implementing each activity, a responsible lead department or staff position, and deadline.

County and City General Plans and Flood Ordinances

Local general plans address flood hazards through policies in their land use and safety elements. In addition, local floodplain management ordinances (e.g., the County of San Diego Flood Damage Prevention Ordinance) promote public health, safety, and general welfare, and minimize public and private losses due to flood conditions. Flood ordinances restrict uses that are dangerous to health, safety, and property due to erosion or water hazards; require uses vulnerable to floods to be protected against flood damage at the time of construction; control the alteration of natural floodplains; control filling, grading, or dredging that may increase flood damage; and prevent construction of flood barriers that divert flood waters or increase flood hazards in other areas. Flood ordinances also include design standards for abutments to prevent collapse or lateral movement during a 100-year flood. Goals of floodplain management and flood ordinances within the San Diego region include:

- Reduce or eliminate existing flood hazards.
- Prevent future flood hazards from developing.
- Reduce the economic losses associated with flooding events.
- Provide for expanded recreational and aesthetic opportunities in the County of San Diego.
- Restore, preserve, and enhance environmental quality wherever possible.
- Improve the quality of life in the San Diego region.

The County of San Diego General Plan, Safety Element (Chapter 7) discusses potential risks of flooding, dam failure, safety procedures, involved agencies, and current and future action policies. The Safety Element (Chapter 7) introduces safety considerations for planning and decision-making to reduce the risk of injury, loss of life, and property damage associated with various hazards identified in the element, including flooding. The Safety Element also proposes policies and recommendations aimed at enhancing public safety through prevention as well as response preparation. Chapter 7 of the Safety Element provides goals and polices related to emergency response for natural or human-induced disasters in the region.

County of San Diego Local Agency Management Program for Onsite Wastewater Treatment Systems

The Local Agency Management Program (LAMP) (County of San Diego, 2015) allows the continued use of onsite wastewater treatment systems (OWTS) within the jurisdiction of San Diego County and expands the local program to permit and regulate alternative OWTS while protecting water quality and public health. The LAMP also applies to OWTS on federal, State, and tribal lands to the extent authorized by law or agreement. The LAMP includes minimum standards for the treatment and ultimate disposal of sewage though the use of OWTS in San Diego County and is designed to protect groundwater sources and surface water bodies from contamination through the proper design, placement, installation, maintenance, and assessment of individual OWTS.

4.10.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts, in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the CEQA Guidelines Appendix G checklist questions. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, and the unique characteristics of the proposed Plan.

Checklist questions for hydrology and water quality impacts are provided in Section X of CEQA Guidelines Appendix G. For purposes of this EIR, the CEQA Guidelines Appendix G, Section X questions have been combined and modified as follows.

- Question (a) regarding water quality standards, waste discharge requirements, and degradation of surface water and groundwater quality; the portion of question (c)(iii) regarding substantial additional sources of polluted runoff; and question (e) regarding conflicts with implementation of a water quality control plan are all addressed in HWQ-1.
- Question (b) addressing decreases in groundwater supplies and substantial interference with groundwater recharge and the portion of question (e) addressing impediments to sustainable management of groundwater basins and the conflict with or obstruction of implementation of a sustainable groundwater management plan have been incorporated into significance criterion WS-2 in Section 4.18, *Water Supply.*
- Question (c), including (c)(i), addressing substantial drainage pattern alterations is included in HWQ-2. The portion of question (c)(iii) regarding the creation or contribution of runoff water in excess of existing or planned stormwater drainage system capacity is addressed in significance criterion U-1 in Section 4.15, *Public Services and Utilities.*
- Question (c), including (c)(ii) and (c)(iv), addressing flooding is included in HWQ-3.
- Question (d) addressing risk of pollutant release in a flood hazard, tsunami, or seiche zone is included as HWQ-4.

For purposes of this EIR, implementation of the proposed Plan would have a significant hydrology or water quality impact if it would:

HWQ-1	Substantially degrade surface water or groundwater quality, including in violation of any water quality standards or waste discharge requirements or in conflict with a water quality control plan or its implementation. ‘
HWQ-2	Substantially alter the existing drainage pattern of an area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site.
HWQ-3	Substantially alter the existing drainage pattern of an area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would (i) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site or (ii) impede or redirect flood flows.
HWQ-4	Substantially increase risk of pollutant release due to inundation of a flood hazard, tsunami, or seiche zone.

4.10.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

HWQ-1 SUBSTANTIALLY DEGRADE SURFACE WATER OR GROUNDWATER QUALITY, INCLUDING IN VIOLATION OF ANY WATER QUALITY STANDARDS OR WASTE DISCHARGE REQUIREMENTS OR IN CONFLICT WITH A WATER QUALITY CONTROL PLAN OR ITS IMPLEMENTATION

ANALYSIS METHODOLOGY

The analysis identifies and maps the existing impaired (i.e., 303(d)-listed) water bodies and the locations where land development from forecasted regional growth and changes to land uses and planned transportation

network improvements would occur for each time horizon. The analysis evaluates if the proposed Plan would result in significant discharges of a pollutant for which a waterbody is already impaired, which could further exacerbate an existing water quality standard violation and result in a significant impact or result in a new discharge that could impair water quality. Construction and operation (i.e., post-construction) of development projects and transportation network improvements are analyzed to determine whether they would contribute substantial additional sources of pollutants found in stormwater runoff from these types of projects and improvements, and would substantially degrade water quality in violation of any water quality standards or WDRs, or would conflict with or obstruct implementation of a water quality control plan. Projects that comply with the construction general permit and local MS4 Permit requirements and implement BMPs to the maximum extent practicable would generally not conflict with or obstruct implementation of the water quality control plan. In addition, the analyses will evaluate if those additional sources of pollutants have the potential to infiltrate into and adversely affect groundwater quality. The operational analysis of transportation network improvements focuses on improvements that would create new impervious surface that would collect pollutants from vehicles, including but not limited to new managed lanes, general purpose lanes, regional arterial projects, and transit centers with parking areas. Active transportation projects and new transit services or transit service improvements would not be major sources of new pollutants during operation and are not analyzed in detail in this section for operational water quality impacts.

The analysis also considers that construction and post-construction activities would be required to adhere to various federal, State, and regional water quality standards, such as the Municipal Permit, Industrial General Permit, and Construction General Permit. As such, runoff volumes and pollutants leaving sites during construction and post-construction operations would be substantially reduced through source control, site design, and/or treatment-control BMPs mandated by these permits. Erosion and sediment controls identified for construction in project-specific SWPPPs would substantially reduce the amount of soil disturbance, erosion and sediment transport into receiving waters, and pollutants in site runoff during construction. Impacts from the proposed Plan would be considered significant if the proposed Plan contributes substantial additional sources of pollutants leading to water quality standards or waste discharge requirements being violated, conflicts with the water quality control plan, or substantially degrades water quality due to implementation of the forecasted regional growth and land use change and planned transportation network improvements.

Water quality impacts from wastewater discharge from wastewater treatment facilities (e.g., Point Loma WWTP and Ocean Outfall; the North City WRP and South Bay WRP) are analyzed. Forecasted regional growth and land use change would generate additional wastewater, which would be treated by regional wastewater treatment facilities. Information from Section 4.15 is used to identify planned capacity of wastewater treatment facilities and future expansion needs of the facility. The analysis determines whether additional demand for wastewater treatment from forecasted regional growth and land use change would contribute to violation of water quality standards or WDRs for wastewater treatment facilities. Transportation network improvements and programs would not generate additional demand for wastewater treatment, and therefore are not analyzed for a contribution to violation of WDRs for wastewater treatment facilities. Impacts on groundwater quality also are analyzed for forecasted regional growth and land use change in areas without sewer systems that are reliant on septic tanks or other alternative wastewater systems.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Construction activities associated with regional growth and land use change under the proposed Plan would generate pollutants, such as sediment, soil stabilization residues, oil and grease, and trash and debris. Construction-related earth disturbing activities would result in short-term water quality impacts associated with soil erosion and subsequent sediment transport to adjacent properties or watercourses via storm drains. Development under the proposed Plan would also increase the amount of impervious surface area in the region, such as new buildings and paved areas. The new impervious surface areas would collect common urban pollutants such as sediment, oil and grease, metals, nutrients, and trash and debris. Development under the proposed Plan would also increase the amount of managed landscaping areas in the region that would provide sources of nutrients, herbicides, and irrigation runoff.

Most development by 2025 would consist of infill development and redevelopment in existing urban and suburban communities that are already highly developed with impervious surfaces. Approximately 78.8 percent of forecasted population growth by 2025 would occur in the City of San Diego (57.9 percent), City of Chula Vista (12.1 percent), and City of Escondido (8.8 percent). Infill and redevelopment would incrementally increase the amount of impervious surface area in existing urban and suburban communities. Conversely, the limited development forecasted on vacant land, open space, and agricultural land would cause greater increases in impervious surfaces (and associated polluted runoff) than infill and redevelopment.

Generally, increases in the amount of impervious surfaces and landscaped areas would result in the accumulation, exposure, and transport of additional pollutants. Runoff during storm events and non-stormwater flows (such as over-irrigation) would transport pollutants through the storm drain system and adversely affect surface water quality if not properly managed. Several creeks and coastal lagoons have existing water quality impairments, therefore any increase in pollutant concentrations from new development would impact water quality, particularly for waterbodies listed as impaired under CWA Section 303(d). However, pollutant types and concentrations in runoff would depend on numerous site and location specific factors, including but not limited to land use type, presence of source control and structural BMPs, site drainage conditions, intensity and duration of rainfall, and climatic conditions preceding a rainfall event.

Compliance with regional, State, and federal water quality regulations would ensure that the increased runoff volume and pollutants generated from development are addressed. Development associated with forecasted growth and land use change under the proposed Plan would be subject to regulatory requirements that substantially reduce surface water quality impacts during construction and post-construction. Construction BMPs that reduce erosion and subsequent sediment transport such as silt fences, fiber rolls, sandbags, berms, and drainage inlet protection would be implemented during construction activities in compliance with the Construction General Permit. For any ground disturbances greater than 1 acre a SWPPP would be implemented. The SWPPP would identify sources of pollutants and erosion and pollution control BMPs that would be implemented during construction to minimize pollutants in stormwater runoff. Implementation of water quality control measures and BMPs would ensure that water quality standards would be achieved, including the water quality objectives that protect designated beneficial uses of surface and groundwater, as defined in the Water Quality Control Plan for the San Diego Basin (basin plan).

During operation and maintenance of development projects, practices would be implemented to reduce stormwater pollution and prevent water quality degradation as required by applicable regulation such as the Municipal Stormwater Permit. Development projects would be required to maintain pre-development hydrology in compliance with enforced hydromodification requirements (Municipal Stormwater Permit, Order R9-2013-0001). Post-construction BMPs would include but are not limited to the following permanent stabilization designs and stormwater quality treatment measures:

- Reestablishment of native vegetation to control erosion.
- LID designs that reduce, treat, infiltrate, and mange stormwater runoff and facilitate groundwater recharge (i.e. detention basins, bioretention systems, infiltration areas, porous paving).
- Runoff conveyance designs that provide adequate storage capacity and overland flow, detention, and infiltration before runoff reaches culverts or detention systems.
- In-line systems such as oil and sediment separators or absorbent filter systems to provide stormwater filtration prior to discharge.
- Hydromodification measures that ensure post-project stormwater runoff does not exceed the pre-development flow and duration.
- Regular street cleaning, litter control, and catch basin cleaning.

Regional Growth and land use change associated with the proposed Plan would also contribute additional demand for wastewater treatment in 2025. As a result, wastewater discharges (primarily residential, commercial, and industrial) from regional wastewater treatment plants such as the Point Loma WWTP and Ocean Outfall, the North City WRP, and South Bay WRP) would increase. Treated wastewater from regional wastewater treatment plants are discharged to surface waters, including the Pacific Ocean. Discharges of water from wastewater treatment plants to surface waters would be in compliance with NPDES permit requirements.

While population growth would result in an increase in the amount of wastewater generated, especially in the cities of San Diego and Chula Vista, the existing wastewater treatment plants would have sufficient capacity to serve forecasted growth through 2025 (see Section 4.15). However, smaller treatment plants throughout the region would need to be expanded to ensure adequate capacity, while also protecting surface, ground, and marine water resources. Development in existing communities would require expansion or upsizing of existing collection and treatment systems, while development in new areas would require installation of new collection and treatment systems. Wastewater treatment facility/infrastructure expansions would be required to comply with ongoing point-source discharge NPDES permits, as well as applicable NPDES general permits and assorted local regulations to minimize impacts on receiving waters.

Marine water quality is regularly monitored by the City of San Diego Environmental Monitoring and Technical Services Laboratory to ensure that the wastewater discharge does not negatively affect water quality or harm aquatic health. This monitoring program would continue, and likely be expanded, relative to new regulatory permit requirements for evaluating and ensuring compliance.

Compliance with applicable regulatory requirements outlined above and in Section 4.10.2, *Regulatory Setting,* would require that pre-development hydrology be maintained after construction is completed; runoff would be treated to remove or substantially reduce pollutants before discharging to surface waters. For projects that discharge to 303(d)-listed impaired water bodies, mandatory BMPs would be implemented to substantially lessen the quantity of pollutants causing the impairment from leaving the site and entering the impaired water body. Wastewater discharges would be in compliance with applicable NPDES permit requirements. Therefore,

regional growth and land use change associated with the proposed Plan would not substantially degrade water quality in violation of water quality standards or WDRs or conflict with a water quality control plan or its implementation. This impact is less than significant.

Transportation Network Improvements and Programs

Transportation infrastructure would contribute to water quality impacts during construction and operations. Construction activities associated with transportation network improvements would increase erosion and subsequent sediment transport to adjacent properties, roadways, or watercourses via storm drains. Construction activities would also generate pollutants, such as sediment, soil stabilization residues, oil and grease, and trash and debris, that could contaminant runoff or receiving waters. In addition, bridge and roadway modification across water courses would be required. Construction disturbances and dredging would have an adverse impact on turbidity affecting water quality, particularly for receiving waters listed as impaired for sediment and/or siltation.

Transportation network improvements under the proposed Plan would also increase the amount of impervious surface area in the region, including new paved areas. New impervious surfaces including freeways, roadways, and parking lots would convey common urban pollutants to landscaped areas. The primary source of water pollution from transportation infrastructure is vehicles and associated oil and grease, metals, sediment, hydrocarbons, trash and debris accumulated on paved surfaces. The main pollutants associated with railway are polycyclic aromatic hydrocarbons (PAHs), heavy metals, and herbicides. The main source of PAHs in railway areas is from machine grease, fuel oils and transformers oils, as well as creosote (railway ties). Sources of heavy metals include rail material abrasion, fuel combustion in diesel-electric locomotives, trolley wires, and cargo leakage. Runoff during storm events and non-stormwater flows (such as over-irrigation) would transport these pollutants through the local storm drain systems. If not properly managed, pollutants in runoff discharged from local storm drain systems could adversely affect surface water quality (particularly CWA Section 303(d) impaired water bodies). In general, bicycle improvements and other active transportation projects do not collect the same type of pollutants as transportation facilities used by vehicles, and therefore runoff from such improvements would not discharge similar vehicle-related pollutants into storm drains and receiving waters.

As shown in Table 4.10-4, a variety of transportation network improvements proposed for 2025 cross 303(d)-listed water bodies. Most improvements would occur in areas that are already highly developed with impervious surfaces. By 2025, most projects that would cross 303(d) waters would either be active transportation projects or local improvements to the regional arterial system (RAS), streets, or road with a more limited potential to introduce large acreages of new impervious surface area. While these facilities are primarily developed urban areas, they also cross 303(d)-listed waters including rivers, creeks, and lagoons. Transportation network improvements in semi-rural and rural areas would result in greater increases in impervious surface area and collection of pollutants relative to existing conditions.

Table 4.10-4
Planned Transportation Network Improvements Crossing 303(d)-listed Water Bodies by 2025

Improvement Type	Description	Impaired Water Body	Hydrologic Unit #
Active Transportation	Inland Rail Trail: Phase 4	Buena Vista Creek	18070303
Active Transportation	San Diego River Trail: Carlton Oaks Segment	Forester Creek	18070304

Improvement Type	Description	Impaired Water Body	Hydrologic Unit #
Active Transportation	San Diego River Trail: Carlton Oaks Segment	San Diego River (Lower)	18070304
Local Improvements – RAS	El Camino Real and Cannon Road	Agua Hedionda Creek	18070303
Local Improvements – RAS	El Camino Real Widening – La Costa Avenue to Arenal Road	San Marcos Creek	18070303
Local Improvements – RAS	Citracado Parkway II	Escondido Creek	18070303
Local Improvements – RAS	College Boulevard Improvements from Avenida de la Plate to Waring Road	Loma Alta Creek	18070303
Local Improvements – RAS	San Marcos Creek Specific Plan – Discovery Street Widening and Flood Control Improvements #88265	San Marcos Creek	18070303
Local Improvements – Street and Road	Grand Avenue Bridge and Street Improvements	San Marcos Creek	18070303
Local Improvements – Street and Road	Via Vera Cruz Bridge and Street Improvements #88264	San Marcos Creek	18070303
Ops/Maintenance – Highway Bridge Program	El Camino Real	San Dieguito River	18070304

As discussed in the Regional Growth and Land Use Change section above, specific regulations, such as the statewide Construction General Permit, are in place to substantially reduce the water quality impacts of construction activities on receiving waters, including 303(d)-listed waters; the Caltrans Statewide Storm Water Program and Management Plan sets forth requirements to substantially reduce or eliminate the discharge of pollutants from construction activities for Caltrans facilities. The need for and design of BMPs would be dictated by the project-related SWPPP and the presence of surrounding sensitive resources. During the SWPPP development process, BMPs would be selected that target the construction-phase pollutant(s) of concern relative to adjacent impaired 303(d)-listed water bodies; operation-phase BMPs would be evaluated during the development of drainage designs. Construction BMPs aimed at reducing erosion and subsequent sediment transport, such as silt fence and/or fiber rolls, sandbag barrier, and slope stabilization, would be implemented during construction activities to substantially reduce or eliminate the discharge of pollutants into receiving waters, including 303(d)- listed water bodies. Implementation of BMPs would also ensure that water quality standards would be achieved, including the water quality objectives that protect designated beneficial uses of surface and groundwater, as defined in the basin plan.

During operations and maintenance of transportation network improvement projects, operational BMPs would be implemented and maintained to substantially lessen the flow of stormwater pollutants into receiving waters, including 303(d)-listed water bodies, to prevent substantial water quality degradation in compliance with applicable stormwater runoff discharge permits (i.e., Municipal Stormwater Permit). Post-construction BMPs would consider factors such as permanent stabilization of disturbed soil and natural stormwater quality treatment and would include LID, hydromodification measures, and erosion control/revegetation efforts. A statewide permit establishes requirements to substantially reduce or eliminate the discharge of pollutants from Caltrans right-of-way to storm drain systems and receiving waters.

Compliance with applicable regulatory requirements outlined above and in Section 4.10.2 would require that pre-development hydrology be maintained after construction and treatment of runoff to substantially reduce

or eliminate the discharge of pollutants to storm drain systems and receiving waters. For projects that discharge to 303(d)-listed impaired water bodies, BMPs would be required that target the removal of the pollutants causing the impairment. Transportation network improvements and programs associated with the proposed Plan would not substantially degrade water quality in violation of applicable water quality standards or WDRs or conflict with a water quality control plan or its implementation. This impact is therefore less than significant.

2025 Conclusion

Implementation of regional growth and land use changes and transportation network improvements associated with the proposed Plan would not substantially degrade water quality in violation of existing standards and WDRs or conflict with a water quality control plan or its implementation because compliance with detailed existing and evolving regulatory requirements would substantially lessen or eliminate the discharge of pollutants into receiving waters, including 303(d)-listed waters, during construction and operations. Therefore, this impact (HWQ-1) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change

As discussed in the 2025 analysis, construction activities associated with regional growth and land use change under the proposed Plan would generate pollutants, such as sediment, soil stabilization residues, oil and grease, and trash and debris. Construction-related earth disturbing activities could result in short-term water quality impacts associated with soil erosion and subsequent sediment transport to adjacent properties or watercourses via storm drains. Development under the proposed Plan would also increase the amount of impervious surface area in the region, such as new buildings and paved areas. The new impervious surface areas would collect common urban pollutants such as sediment, oil and grease, metals, nutrients, and trash and debris. Development under the proposed Plan would also increase the amount of managed landscaping areas in the region that would provide a source of nutrients, herbicides, and irrigation runoff.

Most development by 2035 would consist of infill development and redevelopment in existing urban and suburban communities that are already highly developed with impervious surfaces. Approximately 78 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (70.9 percent) and City of National City (7.3 percent). Similarly, these two jurisdictions accommodate approximately 73 percent of new housing units and 60 percent of new jobs between 2026 and 2035. Infill and redevelopment would incrementally increase the amount of impervious surface area in existing urban and suburban communities. Conversely, the limited development forecasted on vacant land, open space, and agricultural land would cause greater increases in impervious surfaces (and associated polluted runoff) than infill and redevelopment.

Generally, increases in the amount of impervious surfaces and landscaped areas would result in the accumulation, exposure, and transport of additional pollutants. Runoff during storm events and non-stormwater flows would transport pollutants via storm drain systems and adversely affect surface water quality if not properly managed. Several creeks and coastal lagoons have existing water quality impairments; therefore, any increase in pollutant concentrations from new development would impact their water quality, particularly for waterbodies listed as impaired under CWA Section 303(d). However, pollutant types and concentrations in runoff would depend on numerous site- and location-specific factors, as described in the 2025 analysis. Compliance with regional, State, and federal water quality regulations would ensure that the

increased runoff volume and pollutant generation from development are addressed. Development associated with forecasted regional growth and land use change under the proposed Plan would be subject to regulatory requirements that substantially reduce surface water quality impacts during construction and post-construction. Construction BMPs that reduce erosion and subsequent sediment transport (e.g., silt fence, fiber rolls, sandbag barrier, gravel bag berm, drainage inlet protection) would be implemented during construction activities in compliance with the SWPPP and Construction General Permit. Implementation of BMPs would ensure that water quality standards would be achieved, including the water quality objectives that protect designated beneficial uses of surface and groundwater, as defined in the basin plan.

During operations and maintenance of development projects, post-construction practices would be implemented and maintained to substantially reduce stormwater pollution and prevent substantial water quality degradation as required by applicable regulations such as the Municipal Stormwater Permit. Post-construction BMPs are listed in the 2025 analysis.

As discussed in the 2025 analysis, regional growth and land use change associated with the proposed Plan would also contribute additional demand for wastewater, which would increase wastewater discharges (i.e., residential, commercial, and industrial) from regional wastewater treatment plants (e.g., Point Loma WWTP and Ocean Outfall, North City WRP, and South Bay WRP). Treated wastewater from regional wastewater treatment plants is discharged to surface waters, including the Pacific Ocean. NPDES permits govern the discharge of water from wastewater treatment plants to surface waters.

Treatment demands would lead to unwanted wastewater discharges to surface waters (including 303(d) impaired waters) if existing infrastructure is not collaboratively upgraded. The Point Loma WWTP has applied for an NPDES permit renewal per CWA Sections 301(h) and 301(j)(5) under the proposed Pure Water San Diego concept that involves new and improved joint water/wastewater facilities. Upon full implementation of all proposed facilities, approximately 83 mgd of potable reuse water would be ultimately produced from the plant's wastewater stream by the end of 2035 (City of San Diego 2015a). Although the proposed Pure Water San Diego program calls for new potable water reclamation to reduce capacity at treatment facilities, smaller wastewater treatment plants and collection systems throughout the region would need to be expanded to ensure adequate capacity (see Section 4.15), while also protecting surface, ground, and marine water resources (i.e., outfall discharge areas). Development in existing communities would require expansion or upsizing of existing collection and treatment systems, while development in new areas would require installation of new collection and treatment systems. These wastewater treatment facility/infrastructure expansion actions would be required to comply with evolving point-source discharge NPDES permits, as well as applicable NPDES general permits and assorted local regulations to minimize impacts on receiving waters. Ongoing marine water quality monitoring programs would ensure water quality and aquatic health are not adversely impacted by wastewater discharges.

Compliance with applicable regulatory requirements outlined above and in Section 4.10.2 would require that pre-development hydrology be maintained after construction is completed; runoff would be treated to remove or substantially reduce pollutants before discharging to surface waters. For projects that discharge to 303(d)-listed impaired water bodies, mandatory BMPs would be implemented to substantially lessen the quantity of pollutants causing the impairment from leaving the site and entering the impaired water body. Wastewater discharges would be in compliance with applicable NPDES permit requirements. Therefore, regional growth and land use change associated with the proposed Plan would not substantially degrade water quality in violation of water quality standards or WDRs or conflict with a water quality control plan or its implementation. This impact is less than significant.

Transportation Network Improvements and Programs

As discussed in the 2025 analysis, transportation infrastructure contributes to water quality impacts during construction and operations. Construction activities associated with transportation network improvements would increase erosion and subsequent sediment transport to adjacent properties, roadways, or watercourses via storm drains. Construction activities would also generate pollutants, such as sediment, soil stabilization residues, oil and grease, and trash and debris, that could contaminant runoff or receiving waters. In addition, bridges and roadways modifications across water courses would be required. Construction disturbances and dredging would have an adverse impact on turbidity, affecting receiving water quality, particularly for receiving waters listed as impaired for sediment/siltation.

Transportation network improvements under the proposed Plan would also increase the amount of impervious surface area in the region, such as new paved areas. New impervious surfaces including freeways, roadways, and parking lots would convey common urban pollutants to landscaped areas. The primary source of water pollution from transportation infrastructure is vehicles and associated oil and grease, metals, sediment, hydrocarbons, trash and debris. The main pollutants associated with railway are PAHs, heavy metals, and herbicides. Runoff would transport pollutants via local storm drain systems. If not properly managed, pollutants in runoff discharged from local storm drain systems could adversely affect surface water quality. In general, bicycle improvements projects would not collect the same type of pollutants as transportation facilities used by vehicles. Therefore, runoff from such improvements would not discharge vehicle-related pollutants into storm drains and receiving waters.

As shown in Table 4.10-5, a variety of transportation network improvements proposed for 2035 cross 303(d)-listed water bodies. Most improvements would occur in areas that are already highly developed with impervious surfaces or are improvements to existing facilities, including the addition of managed lanes (ML) and managed lane connectors (MLC) to the I-5, I-15, and I-805, among others, each of which cross one or more 303(d)-listed water bodies. The 2035 phase also includes a major new commuter rail line (Route 582) between National City and Sorrento Mesa, which crosses four 303(d)-listed water bodies. Other improvements include a number of active transportation improvements on existing streets in urban areas and along rivers and creeks listed as impaired on the 303(d) list.

Compliance with applicable regulatory requirements described in the 2025 analysis and in Section 4.10.2 would require that pre-development hydrology be maintained after construction and treatment of runoff to substantially reduce or eliminate the discharge of pollutants to storm drain systems and receiving waters. Although these regulations would evolve and change, compliance would ensure impacts on surface water are less than significant as each project is designed, analyzed, and permitted for construction. For projects that discharge to 303(d)-listed impaired water bodies, BMPs would be required that target the removal of the pollutants causing the impairment. Implementation of BMPs would also ensure that water quality standards would be achieved, including the water quality objectives that protect designated beneficial uses of surface and groundwater, as defined in the basin plan. Transportation network improvements and programs associated with the proposed Plan would not substantially degrade water quality in violation of applicable water quality standards or WDRs or conflict with a water quality control plan or its implementation. This impact is therefore less than significant.

Table 4.10-5
Planned Transportation Network Improvements Crossing 303(d)-listed Water Bodies by 2035

Improvement Type	Description	Impaired Water Body	Hydrologic Unit #
Complete Corridor: ML/Goods Movement	I-5 (SR 905 to H Street)	Telegraph Canyon Creek	18070304
Complete Corridor: ML/Goods Movement	I-5 (H Street to Pacific Highway)	Chollas Creek	18070304
		Paleta Creek	18070304
		Paradise Creek, HSA 908.320	18070304
		San Diego River (Lower)	18070304
Complete Corridor: ML/Goods Movement	I-805 (Palm Avenue to H Street)	Telegraph Canyon Creek	18070304
Complete Corridor: ML/Goods Movement	I-5 (Pacific Highway to SR 52)	Rose Creek	18070304
		Tecolote Creek	18070304
Complete Corridor: ML/Goods Movement	I-5 (SR 52 to I-805)	Rose Creek	18070304
		Tecolote Creek	18070304
Complete Corridor: ML/Goods Movement	I-5 (SR 52 to I-805)	Rose Creek	18070304
		Tecolote Creek	18070304
Complete Corridor: ML/Goods Movement	I-15 (I-5 to I-805)	Chollas Creek	18070304
Complete Corridor: ML/Goods Movement	I-15 (I-8 to SR 163)	San Diego River (Lower)	18070304
Complete Corridor: ML/Goods Movement	I-805 (H Street to I-15)	Paleta Creek	18070304
		Telegraph Canyon Creek	18070304
Complete Corridor: ML/Goods Movement	I-805 (I-15 to I-8)	San Diego River (Lower)	18070304
Complete Corridor: ML/Goods Movement	I-805 (Balboa Avenue to NB Bypass Lane)	Carroll Canyon	18070304
		Rose Creek	18070304
Complete Corridor: ML	SR 78 (I-5 to Twin Oaks)	Buena Creek	18070303
		Buena Vista Creek	18070303
		San Marcos Creek	18070303
Complete Corridor: ML	SR 163 (I-8 to I-805)	San Diego River (Lower)	18070304
Complete Corridor: ML	SR 52 (I-15 to Mast Boulevard)	Forester Creek	18070304
		San Diego River (Lower)	18070304
Complete Corridor: MLC	I-5 (I-805)	Los Penasquitos Creek	18070304
		Soledad Canyon	18070304
Complete Corridor: MLC	I-5 (SR 15)	Chollas Creek	18070304
Complete Corridor: MLC	I-805 (I-8)	San Diego River (Lower)	18070304
Transit Leap	Commuter Rail 582	Carroll Canyon	18070304
		Paleta Creek	18070304
		Rose Creek	18070304
		San Diego River (Lower)	18070304

Improvement Type	Description	Impaired Water Body	Hydrologic Unit #
Transit Leap/Goods Movement	Commuter Rail 398	San Luis Rey River, Lower (west of Interstate 15)	18070303
Transit Leap	LRT 399	Buena Creek	18070303
		Buena Vista Creek	18070303
		Escondido Creek	18070303
		Loma Alta Creek	18070303
		San Marcos Creek	18070303
Transit Leap/Goods Movement	LRT 510	Chollas Creek	18070304
		Paleta Creek	18070304
		Paradise Creek, HSA 908.320	18070304
		Telegraph Canyon Creek	18070304
Active Transportation	Coastal Rail Trail Del Mar	San Dieguito River	18070304
Active Transportation	Coastal Rail Trail Oceanside – Alta Loma Marsh bridge	Loma Alta Creek	18070303
		Loma Alta Slough	18070303
Active Transportation	Coastal Rail Trail San Diego – Carmel Valley to Roselle via Sorrento	Los Penasquitos Creek	18070304
		Soledad Canyon	18070304
Active Transportation	Coastal Rail Trail San Diego – Mission Bay (Clairemont to Tecolote)	Tecolote Creek	18070304
Active Transportation	I-15 Bikeway – Camino del Rio South to Rancho Mission Road	San Diego River (Lower)	18070304
Active Transportation	Inland Rail Trail: Oceanside	Loma Alta Creek	18070303
Active Transportation	San Diego River Bikeway Connections	San Diego River (Lower)	18070304
Active Transportation	San Diego River Trail – Mast Park to Lakeside baseball park	San Diego River (Upper)	18070304
Active Transportation	San Diego River Trail – Rancho Mission Road to Camino Del Rio North	San Diego River (Lower)	18070304
Active Transportation	Santee – El Cajon Corridor	Forester Creek	18070304
Local Improvements – RAS	College Boulevard Reach A	Agua Hedionda Creek	18070303
Local Improvements – RAS	Palm Avenue/Interstate 805 Interchange	Poggi Canyon Creek	18070304

2035 Conclusion

Implementation of regional growth and land use changes and transportation network improvements associated with the proposed Plan would not substantially degrade water quality in violation of existing standards and WDRs or conflict with a water quality control plan or its implementation because compliance with detailed existing and evolving regulatory requirements would substantially lessen or eliminate the discharge of pollutants into receiving waters, including 303(d)-listed waters, during construction and operations. Therefore, this impact (HWQ-1) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change

As discussed in the 2025 and 2035 analyses, construction associated with regional growth and land use change under the proposed Plan would generate pollutants. Construction-related earth disturbing activities would result in short-term water quality impacts associated with soil erosion and subsequent sediment transport to adjacent properties or watercourses via storm drains. Development under the proposed Plan would also increase the amount of impervious surface area in the region, such as new building rooftops and paved areas. The new impervious surface areas would collect common urban pollutants such as sediment, oil and grease, metals, nutrients, and trash and debris. Development under the proposed Plan would also increase the amount of managed landscaping areas in the region that would provide a source of nutrients, weed abatement herbicides, and irrigation runoff.

Most development by 2050 would consist of infill development and redevelopment in existing urban and suburban communities that are already highly developed with impervious surfaces. Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), the City of Chula Vista (28 percent), and the City of San Marcos (13 percent). Similarly, these three jurisdictions accommodate approximately 89 percent of new housing units and 72 percent of new jobs between 2036 and 2050. Infill and redevelopment would incrementally increase the amount of impervious surface area in existing urban and suburban communities. Conversely, the limited development forecasted on vacant land, open space, and agricultural land would cause greater increases in impervious surfaces (and polluted runoff) than infill and redevelopment.

Increases in the amount of impervious surfaces and landscaped areas would generally result in the accumulation, exposure, and transport of additional pollutants. Runoff during storm events and non-stormwater flows would transport pollutants via storm drain systems and could adversely affect surface water quality if not properly managed. Several creeks and coastal lagoons have existing water quality impairments, therefore any increase in pollutant concentrations from new development would impact water quality, particularly for waterbodies listed as impaired under CWA Section 303(d). However, pollutant types and concentrations in runoff would depend on numerous site and location-specific factors, as described in the 2025 analysis.

Compliance with regional, State, and federal water quality regulations would ensure that the increased runoff volume and pollutant generation from development are addressed. Development associated with forecasted regional growth and land use change under the proposed Plan would be subject to regulatory requirements that substantially reduce surface water quality impacts during construction and post-construction. Construction BMPs that reduce erosion and subsequent sediment transport such as silt fences, fiber rolls, sandbags, gravel bag berm, and drainage inlet protection would be implemented during construction activities in compliance with the SWPPP and Construction General Permit. Implementation of BMPs would also ensure that water quality standards would be achieved, including the water quality objectives that protect designated beneficial uses of surface and groundwater, as defined in the basin plan.

During operations and maintenance of development projects, post-construction practices would be implemented and maintained to substantially reduce stormwater pollution and prevent substantial water quality degradation as required by applicable regulations including the Municipal Stormwater Permit). Post-construction BMPs are listed in the 2025 analysis.

As discussed in the 2025 and 2035 analyses, regional growth and land use change associated with the proposed Plan would also contribute additional demand for wastewater treatment, which would increase wastewater discharges (i.e., residential, commercial, and industrial) from regional wastewater treatment plants (e.g., Point Loma WWTP and Ocean Outfall, North City WRP, and South Bay WRP). Treated wastewater from regional wastewater treatment plants is discharged to surface waters, including the Pacific Ocean. NPDES permits govern the discharge of water from wastewater treatment plants to surface waters. As discussed earlier, the recent NPDES permit renewal for the Point Loma WWTP under the proposed Pure Water San Diego concept specifies new and improved joint water/wastewater facilities that would divert approximately 83 mgd of wastewater from the plant's wastewater stream in the form of potable reuse water by the end of 2035 (City of San Diego 2015a). Although the proposed Pure Water San Diego program calls for new potable water reclamation to reduce capacity concerns, smaller regional collection systems and treatment facilities in areas of increased growth would require expansion to ensure adequate capacity in 2050 (see Section 4.15), while also protecting surface, ground, and marine water resources (i.e., outfall discharge areas). Development in existing communities would require expansion or upsizing of existing collection and treatment systems, while development in new areas would require installation of new collection and treatment systems. These wastewater treatment facility/infrastructure expansion actions would be required to comply with evolving point-source-discharge NPDES permits, as well as applicable NPDES general permits and assorted local regulations to minimize impacts on receiving waters. Ongoing marine water quality monitoring programs would ensure water quality are not adversely impacted by wastewater discharges.

Compliance with applicable regulatory requirements outlined above and in Section 4.10.2 would require that pre-development hydrology be maintained after construction is completed; runoff would be treated to remove or substantially reduce pollutants before discharging to surface waters. For projects that discharge to 303(d)-listed impaired water bodies, mandatory BMPs would be implemented to substantially lessen the quantity of pollutants causing the impairment from leaving the site and entering the impaired water body. Wastewater discharges would be in compliance with applicable NPDES permit requirements. Therefore, regional growth and land use change associated with the proposed Plan would not substantially degrade water quality in violation of water quality standards or WDRs or conflict with a water quality control plan or its implementation. This impact is less than significant.

Transportation Network Improvements and Programs

As described in the 2025 and 2035 analyses, transportation infrastructure contributes to water quality impacts during construction and operations. Construction activities associated with transportation network improvements would increase erosion and subsequent sediment transport to adjacent properties, roadways, or watercourses via storm drains. Construction activities could also generate pollutants that could contaminant impact runoff or receiving waters. In addition, as bridges and roadways modifications across water courses would be required. Construction disturbances and dredging would have an adverse impact turbidity, affecting receiving water quality, particularly receiving waters listed as impaired for sediment/siltation.

Transportation network improvements under the proposed Plan would also increase the amount of impervious surface area in the region, such as new paved areas. New impervious surfaces including freeways, roadways, and parking lots would convey common urban pollutants to landscaped areas. The primary source of water pollution from transportation infrastructure is vehicles and associated oil and grease, metals, sediment, hydrocarbons, trash and debris. The main pollutants associated with railway are PAHs, heavy metals, and herbicides. Runoff would transport pollutants via local storm drain systems. If not properly managed, pollutants in runoff discharged from local storm drain systems could adversely affect surface water quality. In general, bicycle improvements projects would not collect the same type of pollutants as transportation facilities

used by vehicles. Therefore, runoff from such improvements would not discharge vehicle-related pollutants into storm drains and receiving waters.

As shown in Table 4.10-6, several planned transportation network improvements by 2050 cross 303(d)- listed water bodies. Most improvements would occur in areas that are already highly developed with impervious surfaces or are improvements to existing facilities, including the addition of managed lanes to the I-5, I-805, SR 52, SR 54, and SR 125, each of which cross multiple 303(d)-listed water bodies. Transit Leap improvements such as new Commuter Rail routes from National City to the U.S. Border (Route 582 [Extension]) and the Central Mobility Hub to the U.S. Border (Route 583) would also cross 303(d)-listed water bodies. Finally, like other phase years, a number of active transportation improvements would be located on existing streets in urban areas and along rivers and creeks listed as impaired on the 303(d) list.

Compliance with applicable regulatory requirements described in the 2025 analysis and in Section 4.10.2 would require that pre-development hydrology be maintained after construction and treatment of runoff to substantially reduce or eliminate the discharge of pollutants to storm drain systems and receiving waters. Although these regulations would evolve and change, compliance would ensure impacts on surface water are less than significant as each project is designed, analyzed, and permitted for construction. For projects that discharge to 303(d)-listed impaired water bodies, BMPs would be required that target the removal of the pollutants causing the impairment. Implementation of BMPs would also ensure that water quality standards would be achieved, including the water quality objectives that protect designated beneficial uses of surface and groundwater, as defined in the basin plan. Transportation network improvements and programs associated with the proposed Plan would not substantially degrade water quality in violation of applicable water quality standards or WDRs or conflict with a water quality control plan or its implementation. This impact is therefore less than significant.

Table 4.10-6
Planned Transportation Network Improvements Crossing 303(d)-listed Water Bodies by 2050

Improvement Type	Description	Impaired Water Body	Hydrologic Unit #
Complete Corridor: ML/Goods Movement	I-5 (Cassidy Street to Harbor Drive)	Loma Alta Creek	18070303
		San Luis Rey River, Lower (west of Interstate 15)	18070303
Complete Corridor: ML/Goods Movement	I-5 (Harbor Drive to County Line)	San Mateo Creek	18070301
		Santa Margarita River (Lower)	18070302
Complete Corridor: ML/Goods Movement	I-5 (SR 56 to Via de La Valle)	Batiquitos Lagoon	18070303
		Buena Vista Creek	18070303
		Buena Vista Lagoon	18070303
		San Dieguito River	18070304
		San Elijo Lagoon	18070303
		San Marcos Creek	18070303
Complete Corridor: ML/Goods Movement	I-5 (Via de La Valle to La Costa)	Batiquitos Lagoon	18070303
		Buena Vista Creek	18070303
		Buena Vista Lagoon	18070303
		San Dieguito River	18070304

Improvement Type	Description	Impaired Water Body	Hydrologic Unit #
		San Elijo Lagoon	18070303
		San Marcos Creek	18070303
Complete Corridor: ML/Goods Movement	I-5 (La Costa to Cassidy Street)	Batiquitos Lagoon	18070303
		Buena Vista Creek	18070303
		Buena Vista Lagoon	18070303
		San Dieguito River	18070304
		San Elijo Lagoon	18070303
		San Marcos Creek	18070303
Complete Corridor: ML/Goods Movement	I-805 (SR 905 to Palm Avenue)	Poggi Canyon Creek	18070304
Complete Corridor: ML/Goods Movement	I-805 (Palm Avenue to H Street)	Poggi Canyon Creek	18070304
Complete Corridor: ML/Goods Movement	I-15 (Valley Parkway to SR 76)	Keys Creek	18070303
		Moosa Canyon Creek	18070303
		Rainbow Creek	18070302
		San Luis Rey River, Upper (east of Interstate 15)	18070303
Complete Corridor: ML	SR 52 (I-5 to I-805)	Rose Creek	18070304
Complete Corridor: ML	SR 125 (SR 905 to SR 54)	Poggi Canyon Creek	18070304
		Sweetwater River, Lower (below Sweetwater Reservoir)	18070304
		Telegraph Canyon Creek	18070304
Complete Corridor: MLC	I-805 (I-8)	San Diego River (Lower)	18070304
Complete Corridor: MLC	I-805 (I-8)	San Diego River (Lower)	18070304
Complete Corridor: Connector	I-5 (I-8)	San Diego River (Lower)	18070304
Transit Leap	Commuter Rail 583	Chollas Creek	18070304
		Paleta Creek	18070304
		Paradise Creek, HSA 908.320	18070304
		San Diego Bay	18070304
		San Diego Bay Shoreline, Downtown Anchorage	18070304
		Telegraph Canyon Creek	18070304
Transit Leap/Goods Movement	Commuter Rail 398	Los Penasquitos Creek	18070304
		Soledad Canyon	18070304
Transit Leap/Goods Movement	LRT 510	Chollas Creek	18070304
		Paleta Creek	18070304
		Paradise Creek, HSA 908.320	18070304
		Telegraph Canyon Creek	18070304

Improvement Type	Description	Impaired Water Body	Hydrologic Unit #
Transit Leap	Commuter Rail 582	Paradise Creek, HSA 908.320	18070304
		Telegraph Canyon Creek	18070304
Active Transportation	Encinitas to San Marcos Corridor – Double Peak Drive to San Marcos Boulevard	San Marcos Creek	18070303
Active Transportation	Encinitas to San Marcos Corridor – Leucadia Boulevard to El Camino Real	Encinitas Creek	18070303
Active Transportation	I-15 Bikeway – Murphy Canyon Road to Affinity Court	Carroll Canyon	18070304
		Rose Creek	18070304
Active Transportation	San Luis Rey River Trail	Green Canyon Creek	18070303
		Keys Creek	18070303
		San Luis Rey River, Lower (west of Interstate 15)	18070303
Active Transportation	SR 125 Connector – Bonita Road to U.S.–Mexico Border	Poggi Canyon Creek	18070304
		Telegraph Canyon Creek	18070304
Active Transportation	SR 52 Bikeway – I-5 to Santo Road	Rose Creek	18070304
Active Transportation	SR 52 Bikeway – SR 52/Mast Drive to San Diego River Trail	San Diego River (Lower)	18070304

2050 Conclusion

Implementation of regional growth and land use changes and transportation network improvements associated with the proposed Plan would not substantially degrade water quality in violation of existing standards and WDRs or conflict with a water quality control plan or its implementation because compliance with detailed existing and evolving regulatory requirements would substantially lessen or eliminate the discharge of pollutants into receiving waters, including 303(d)-listed waters, during construction and operations. Therefore, this impact (HWQ-1) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change impacts in the San Diego region related to surface water and groundwater quality as described in Section 4.10.1, the proposed Plan would not exacerbate climate change effects on surface water and groundwater quality if development and transportation projects implementing the proposed Plan remain in compliance with existing and evolving regulatory requirements.

HWQ-2 SUBSTANTIALLY ALTER THE EXISTING DRAINAGE PATTERN OF AN AREA, INCLUDING THROUGH THE ALTERATION OF THE COURSE OF A STREAM OR RIVER OR THROUGH THE ADDITION OF IMPERVIOUS SURFACES, IN A MANNER WHICH WOULD RESULT IN SUBSTANTIAL EROSION OR SILTATION ON- OR OFF-SITE

ANALYSIS METHODOLOGY

If an alteration occurred in a manner that would result in substantial erosion or siltation on- or off site, implementation of the proposed Plan would result in a significant impact. The implementation of land use changes leading to future development and transportation network improvement projects under the proposed Plan would alter existing topography and drainage patterns and could increase stormwater runoff volume and rates as a result of increased impervious area. The proposed Plan would be qualitatively evaluated for adherence to maintaining pre-development hydrology, properly minimizing and treating project runoff, and appropriate incorporation of LID site design are analyzed to assess resulting impacts associated with erosion and siltation. Implementation of the proposed Plan would have a significant impact related to the existing drainage pattern if implementation were to substantially increase erosion or siltation on- or off site.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Regional growth and land use change associated with the proposed Plan would change drainage patterns, increase impervious surface area, add pollutant sources, and reduce natural (i.e., undeveloped) landscape. From 2016 to 2025, the region is forecasted to increase by 161,338 people (4.8 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). Approximately 78.8 percent of the 2025 population growth would occur within the City of San Diego, City of Chula Vista, and City of Escondido. Most development between 2016 and 2025 would consist of infill development and redevelopment in existing urban and suburban communities that are already highly developed with impervious surfaces. Infill and redevelopment would incrementally increase the amount of impervious surface area in existing urban and suburban communities. However, development forecasted on vacant land, open space, and agricultural land, mainly in rural areas in San Diego County, would cause greater increases in impervious surfaces than infill and redevelopment, resulting in alterations to existing drainage patterns. Forecasted regional growth and land use change in the coastal areas of the region, including parts of the City of San Diego, would be located on soils that are unstable or that may become unstable making them more susceptible to erosion as a result of the development. Forecasted regional growth and land use change in the desert portion of the region, including parts of San Diego County and extending into Imperial and Riverside Counties would be located on undeveloped land with soils susceptible to erosion as a result of the development. In addition, development under the proposed Plan would occur on or adjacent to steep slopes, which would increase erosion and sediment discharge if disturbed slopes are unstable.

Such changes would be closely regulated by the federal, State, and local laws described earlier. Impacts resulting from construction would be primarily addressed through compliance with the Construction General Permit as discussed in Impact HWQ-1. A SWPPP would be implemented for any ground disturbance greater than one acre and would identify the sources of pollutants that may affect the quality of stormwater and would include construction site BMPs to control erosion and minimize pollutants (e.g., sedimentation/siltation) in runoff.

During operations and maintenance, development projects would maintain pre-development hydrology in compliance with current hydromodification requirements of the Municipal Stormwater Permit (Order R9- 2013-0001). Although these regulations would evolve over time, their intent would remain in effect and serve to mitigate or otherwise control increased stormwater flows and erosion in an effort to maintain pre-

development hydrology. Therefore, any additional runoff volumes and peak flow discharges from impervious areas, such as new building rooftops and paved areas, must be attenuated such that drainage or conveyance capacities are not adversely impacted. As a result, runoff for post-construction operations would be required to be mitigated and treated through LID, onsite design, and/or offsite structural BMPs. Detailed hydrologic and hydraulic calculations for proposed stormwater treatment measures, such as storm drains and for sizing of rock riprap energy dissipaters at storm drains to reduce storm runoff to non-erosive velocities, would be required. LID and incorporation of natural spaces, such as detention basins, infiltration strips, and porous paving, that reduce, infiltrate, and manage stormwater runoff flows would be required for all new developments. These measures would be required to be properly sized and engineered to substantially lessen runoff from development thereby avoiding substantial erosion or siltation on- or off site.

By incorporating these prescriptive design standards in compliance with regulatory requirements into development projects associated with regional growth and land use change, surface runoff patterns and erosive flows would be controlled. Through the requirements to incorporate hydromodification measures, the regional growth and land use changes would maintain pre-development hydrology. Therefore, development associated with regional growth and land use change would not substantially alter existing drainage patterns such that erosion or siltation on- or off site would increase by 2025. This impact is less than significant.

Transportation Network Improvements and Programs

The proposed transportation network improvements (e.g., highway, arterial, transit, and bicycle) would result in alterations to drainage patterns without the incorporation of the appropriate BMPs. By 2025, additional transportation network improvements and programs would be developed, including new Managed Lanes on I-5 from Manchester Avenue to Vandegrift, new toll lanes on SR 11 to the Otay Mesa Port of Entry (POE), Interchange and Arterial Operational improvements at SR 94 and SR 125, Otay Mesa POE Commercial Vehicle Enforcement Facility (CVEG) modernization, pilot programs for streamlining commercial vehicle operations for reducing wait times at the Otay Mesa POE, improvements to the Otay Mesa POE southbound truck route, including Otay Truck Route and La Media Road, and tolling equipment and Regional Border Management System investments on SR 11. There also would be over 25 improvements to local arterial streets at locations throughout the region, including widenings and extensions of existing roadways, new or replaced bridges, and realignments. Major Transit Leap improvements would include double- tracking at certain locations on the Los Angeles–San Diego–San Luis Obispo (LOSSAN) rail corridor along with a station addition in the Gaslamp Quarter, San Diego. Some of these improvements and programs may involve major grading or earthwork resulting in temporary changes to existing drainage patterns during construction. Grading and recontouring would be dependent on project alignments, existing topography, and the size/extent of runoff conveyance systems. While most of the transportation network improvements would occur in already urbanized areas, some improvements, mainly in San Diego County, would occur on vacant land and would cross natural drainage areas. Impacts on both upstream and downstream resources result from alterations to streams, rivers, and floodways, such as increases in impervious areas and the construction of bridge pilings. The introduction of new or expanded bridge pilings can cause scouring and changes in the transportation and deposition of sediment both upstream and downstream. Impervious areas increase stormwater flow volume and/or velocity, thereby increasing scouring and erosion in channels. As with regional growth and land use changes, the transportation network improvements in place by 2025 that are located in, on, or near hills, coastal areas, canyons, and other places with steep slopes or unstable soils, including parts of the City of San Diego, would increase the potential for erosion.

Current design practices employed in accordance with local hydromodification management plans (HMPs); Caltrans standards; and other related regulations and programs, including Federal Highway Administration

(FHWA), Federal Transit Administration (FTA), and Caltrans policies on adapting to climate change, sea-level rise, and flooding, require that engineered conveyances (whether hardscaped or soft bottom) integrate energy dissipation protection, streambank erosion protection, bridge pier scour protection, and other suitable design controls to eliminate or substantially reduce erosion and transport of sediment or silt to downstream areas. By incorporating these standard engineering practices and complying with regulatory requirements such as the Construction General Permit, Municipal Stormwater Permit, and the Caltrans NPDES Permit, on- and offsite erosion would be avoided or substantially reduced.

In areas with highly erosive soils, additional site design controls would be used to ensure stabilization under a variety of storm intensities. By incorporating these types of prescriptive design standards in compliance with regulatory requirements, surface runoff patterns, and erosive flows associated with transportation network improvements would be controlled. Through the various hydromodification requirements that would be in place, the transportation network improvements would maintain pre-development hydrology. Therefore, transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns such that erosion or siltation would increase by 2025. This impact is less than significant.

2025 Conclusion

Compliance with regulatory requirements and implementation of similar design measures described above and in Section 4.10.2 would ensure that regional growth and land use changes as well as transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns such that erosion or siltation would increase. Through the various requirements to incorporate hydromodification and LID measures, the proposed Plan would maintain pre-development hydrology, and would reduce, infiltrate, and properly manage stormwater runoff such that on- or offsite flooding would not occur. Therefore, this impact (HWQ-2) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change

Similar to 2025, regional growth and land use change associated with the proposed Plan would change drainage patterns, increase impervious surface area, add pollutant sources, and reduce natural, undeveloped landscape. Most development by 2035 would consist of infill development and redevelopment in existing urban and suburban communities that are already highly developed with impervious surfaces. From 2026 to 2035, the region is forecasted to increase by 149,500 people (4.3 percent), 121,650 housing units (9.4 percent), and 159,728 jobs (9 percent). Approximately 78 percent of the 2035 population growth would occur in the City of San Diego and City of National City. Infill and redevelopment would incrementally increase the amount of impervious surface area in existing urban and suburban communities. Conversely, development forecasted on vacant land, open space, and agricultural land, mainly in the County of San Diego, would cause greater increases in impervious surfaces than infill and redevelopment. Impacts would be greater by 2035 than by 2025 as more development or redevelopment activities would occur in coastal communities, desert portions of the region, or near areas with canyons and hills, including parts of the City of San Diego.

Such changes would be closely regulated by the federal, State, and local laws described earlier. Plan related projects would need to comply with a variety of regulatory requirements for controlling erosion and siltation, depending upon the type of project, and design standards and other applicable regulations would serve to reduce impacts. Altered surface runoff drainage patterns would require adequate controls for scour protection

and other drainage stabilization needs. Construction impacts would generally be addressed through compliance with the Construction General Permit. A SWPPP would be implemented for any ground disturbance greater than one acre. The SWPPP requires implementation of construction site BMPs to minimize temporary changes to existing drainage patterns and to properly control and minimize runoff.

Following construction completion, development projects would be required to maintain pre-development hydrology in compliance with hydromodification requirements similar to those currently prescribed in the Municipal Stormwater Permit (Order R9-2013-0001). Runoff for operations would be required to be mitigated and treated through recommended LID, site design, and/or structural BMPs. As with 2025 requirements, LID measures such as detention basins, infiltration strips, and porous paving for development projects would be mandatory to mitigate stormwater runoff impacts. These measures would reduce or avoid hydromodification effects, and erosion impacts. By incorporating these prescriptive design standards in compliance with regulatory requirements into development projects associated with regional growth and land use change, surface runoff patterns and erosive flows would be controlled. Through the requirements to incorporate hydromodification measures, the regional growth and land use changes would maintain pre-development hydrology. Therefore, development associated with regional growth and land use change would not substantially alter existing drainage patterns such that erosion and siltation would increase by 2035. This impact is less than significant.

Transportation Network Improvements and Programs

Similar to the 2025 analysis, the proposed transportation network improvements would result in alterations to drainage patterns without the incorporation of appropriate BMPs. Some of these improvements and programs may involve major grading or earthwork resulting in temporary or permanent changes to existing drainage patterns. While most of the transportation network improvements would occur in already urbanized areas, some improvements, mainly in the County of San Diego, would occur on vacant land, increasing impervious surface areas, stormwater flow volume and/or velocity, and scouring and erosion in channels. Transportation network improvements, such as the addition of Managed Lanes and general purpose lanes, would occur in areas of unstable soils, particularly improvements located in hilly or coastal areas, such as the Managed Lanes along the I-5, making these areas more susceptible to erosion. Specific transportation facilities located in areas prone to unstable soils include coastal projects or expansion of rail through coastal areas or canyons. The Central Mobility Hub and San Ysidro Mobility Hub projects are not expected to be located in areas prone to unstable soils. Transportation network improvements in place by 2035 are shown in Figures 2-16 and 2-19. Required design standards for transportation development would apply. By incorporating the required design standards and complying with all applicable regulations, changes to surface runoff patterns, drainage patterns, and runoff flows would be substantially lessened. Required design practices (e.g., municipal HMPs, Caltrans standards, FHWA, FTA) mandate that engineered conveyances (whether hardscaped or soft bottom) integrate energy dissipation protection, streambank erosion protection, bridge pier scour protection, and other suitable design controls to eliminate or substantially lessen erosion and the transport of sediment or silt to downstream areas.

By incorporating these types of prescriptive design standards in compliance with regulatory requirements, surface runoff patterns and erosive flows associated with transportation network improvements would be controlled. Through the various hydromodification requirements that would be in place, the transportation network improvements would maintain pre-development hydrology. Therefore, transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns such that erosion and siltation would increase by 2035. This impact is less than significant.

2035 Conclusion

Compliance with regulatory requirements and implementation of similar design measures described above and in Section 4.10.2 would ensure that regional growth and land use changes as well as transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns such that erosion and siltation would increase. Through the various requirements to incorporate hydromodification and LID measures, the proposed Plan would maintain pre-development hydrology, and would reduce, infiltrate, and properly manage stormwater runoff. Therefore, this impact (HWQ-2) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change

Similar to the 2025 and 2035 analyses, regional growth and land use change associated with the proposed Plan would change drainage patterns, increase impervious surface area, add pollutant sources, and reduce natural, undeveloped landscape. Most development by 2050 would consist of infill development and redevelopment in existing urban and suburban communities that are already highly developed with impervious surfaces. From 2036 to 2050, the region is forecasted to increase by 125,725 people (3.4 percent), 61,433 housing units (4.3 percent), and 164,843 jobs (8.5 percent). Approximately 78 percent of the 2050 population growth would occur in the City of San Diego, City of Chula Vista, and City of San Marcos. Infill and re-development would incrementally increase the amount of impervious surface area in existing urban and suburban communities. Conversely, development forecasted on vacant land, open space, and agricultural land, mainly in the County of San Diego, would cause greater increases in impervious surfaces than infill and redevelopment. Forecasted regional growth and land use change in the coastal areas of the region or near areas with canyons and hills, including parts of the City of San Diego, would increase erosion and sediment discharge if disturbed slopes are unstable. However, Plan related projects would need to comply with a variety of regulatory requirements for controlling erosion, siltation, and floodwater, as well as design standards and other applicable regulations to reduce impacts. Construction impacts would generally be addressed through compliance with the Construction General Permit. For projects disturbing more than 1 acre, a SWPPP and associated BMPs would be implemented to control and minimize runoff.

Operations and maintenance for development projects would be required to maintain pre-development hydrology in compliance with enforced hydromodification requirements, similar to requirements in the Municipal Stormwater Permit (Order R9-2013-0001), which would require LID, onsite design, and/or offsite structural BMPs. These measures would substantially reduce runoff rates and volumes such that impacts associated with erosion would be avoided or minimized.

By incorporating design standards in compliance with regulatory requirements into development projects associated with regional growth and land use change, surface runoff patterns, and erosive flows would be controlled. Through the requirements to incorporate hydromodification measures, the regional growth and land use changes would maintain pre-development hydrology. Therefore, development associated with regional growth and land use change would not substantially alter existing drainage patterns such that erosion and siltation would increase by 2050. This impact is less than significant.

Transportation Network Improvements and Programs

Similar to 2025 and 2035 analyses, the proposed transportation network improvements by 2050 would result in impacts on drainage patterns without the incorporation of the appropriate BMPs. Transportation facilities that would alter existing drainage patterns include improvements near the coast, and improvements to highways that would involve grading. While most of the transportation network improvements would occur in already urbanized areas, some improvements, mainly in the County of San Diego, would occur on vacant land, increasing impervious surface areas, stormwater flow volume and/or velocity, and scouring and erosion in channels. Similar to the 2025 and 2035 analyses, transportation network improvements would occur in areas with unstable soils, particularly improvements located in hilly or coastal areas such as the Coastal Rail Trail improvements, making these areas more susceptible to erosion. Transportation network improvements in place by 2050 are shown in Figures 2-17 and 2-20. Transportation network improvements and programs proposed under the proposed Plan would be required to conform to and comply with water quality protection regulations and, as such, would employ necessary erosion protection and siltation control into their respective designs. Changes to surface runoff patterns, drainage patterns, and flows would be substantially less as a result. Required design practices (e.g., municipal HMPs, Caltrans standards, FHWA, FTA) would be implemented to eliminate or substantially reduce increased risk of erosion and siltation.

By incorporating design standards in compliance with regulatory requirements, surface runoff patterns, and erosive flows associated with transportation network improvements would be controlled. Through the various hydromodification requirements that would be in place, the transportation network improvements would maintain pre-development hydrology. Therefore, transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns such that erosion and siltation would increase by 2050. This impact is less than significant.

2050 Conclusion

Compliance with regulatory requirements and implementation of similar design measures described above and in Section 4.10.2 would ensure that regional growth and land use changes as well as transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns such that erosion and siltation would increase. Through the various requirements to incorporate hydromodification and LID measures, the proposed Plan would maintain pre-development hydrology, and would reduce, infiltrate, and properly manage stormwater runoff. Therefore, this impact (HWQ-2) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change impacts related to alteration of drainage patterns as described in Section 4.10.1, the proposed Plan would not exacerbate climate change effects on drainage patterns if development and transportation projects implementing the proposed Plan remain in compliance with existing and evolving regulatory requirements controlling erosion and siltation, as well as design standards (i.e., hydromodification and LID measures) and other applicable regulations to reduce impacts.

HWQ-3 SUBSTANTIALLY ALTER THE EXISTING DRAINAGE PATTERN OF AN AREA, INCLUDING THROUGH THE ALTERATION OF THE COURSE OF A STREAM OR RIVER OR THROUGH THE ADDITION OF IMPERVIOUS SURFACES, IN A MANNER WHICH WOULD (I) SUBSTANTIALLY INCREASE THE RATE OR AMOUNT OF SURFACE RUNOFF IN A

MANNER WHICH WOULD RESULT IN FLOODING ON- OR OFF-SITE OR (II) IMPEDE OR REDIRECT FLOOD FLOWS

ANALYSIS METHODOLOGY

If an alteration occurred in a manner that would result in substantial flooding on- or off site or in the impediment or redirection of flood flows, implementation of the proposed Plan would result in a significant impact. The land use changes leading to future development and transportation network improvement projects under the proposed Plan would alter existing topography and drainage patterns and could increase stormwater runoff volume and rates due to increased impervious area. Land use development generally alters drainage patterns by redistributing runoff that is discharging to waterbodies (hydromodification) while linear transportation projects can result in direct modifications to waterbodies through new and modified water crossing structures (e.g., bridges and culverts). Therefore, hydromodification and increased flood risks from modified water crossings or impeded or redirected flood flows would be qualitatively evaluated for impacts under the proposed Plan. The proposed Plan is qualitatively evaluated for maintaining pre-development hydrology, properly minimizing and treating project runoff, and incorporating LID site design, and then analyzed to assess any resulting impacts associated with flooding. Implementation of the proposed Plan would have a significant impact related to the existing drainage pattern if it were to substantially increase flooding on- or off site or cause the impediment or redirection of flood flows.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

As discussed in Impact HWQ-2, regional growth and land use change associated with the proposed Plan would change drainage patterns, increase impervious surface area, add pollutant sources, and reduce natural (i.e., undeveloped) landscape. Development forecasted on vacant land, open space, and agricultural land, mainly in rural areas in San Diego County, would cause greater increases in impervious surfaces than infill and redevelopment, resulting in alterations to existing drainage patterns and an increase in potential for flooding, impeded, or redirected flood flows.

Potential flooding impacts resulting from construction would be primarily addressed through compliance with the Construction General Permit and the requirement to develop a SWPPP as discussed in Impact HWQ-1. These would require the implementation of BMPs during construction to minimize runoff from the construction site and reduce the potential for any on- or offsite flooding. During operations and maintenance, development projects would maintain pre-development hydrology in compliance with current hydromodification requirements of the Municipal Stormwater Permit (Order R9- 2013-0001) as discussed in Impact HWQ-2. Runoff from post-construction operations would be required to be mitigated and treated through LID, onsite design, and/or offsite structural BMPs. LID and incorporation of natural spaces, such as detention basins, infiltration strips, and porous paving that reduce, infiltrate, and manage stormwater runoff flows, would be required for all new developments. These measures would be required to be properly sized and engineered to substantially lessen runoff from development, thereby avoiding adverse hydromodification and flooding impacts. In addition, the contractor would comply with the minimum construction BMPs identified in the Regional MS4 Permit and implement construction BMPs to manage stormwater runon and runoff from individual construction sites. Therefore, the proposed Project would not result in construction impacts associated with impeding or redirecting flood flows.

By incorporating these prescriptive design standards in compliance with regulatory requirements into development projects associated with regional growth and land use change, surface runoff patterns and flooding would be controlled. Through the requirements to incorporate hydromodification measures, the regional growth and land use changes would maintain pre-development hydrology and would not substantially or impede or redirect flood flows. Therefore, development associated with regional growth and land use change would not substantially alter existing drainage patterns such that flooding on- or off site would increase by 2025. This impact is less than significant.

Transportation Network Improvements and Programs

As discussed in Impact HWQ-2, transportation network improvements (e.g., highway, arterial, transit, and bicycle) would result in alterations to drainage patterns without the incorporation of the appropriate BMPs. Some of these improvements and programs may involve major grading or earthwork, resulting in temporary changes to existing drainage patterns during construction. Grading and recontouring would be dependent on project alignments, existing topography, and the size/extent of runoff conveyance systems. While most of the transportation network improvements would occur in already urbanized areas, some improvements, mainly in San Diego County, would occur on vacant land and would cross natural drainage areas. Impacts on both upstream and downstream resources result from alterations to streams, rivers, and floodways, such as increases in impervious areas and the construction of bridge pilings. Impervious areas increase stormwater flow volume and/or velocity, thereby increasing the risk of flooding. However, no other structures apart from bridge pilings are anticipated to be added associated with transportation network improvements that could redirect or exacerbate existing flood flows. In addition, the contractor would comply with the minimum construction BMPs identified in the Regional MS4 Permit and implement construction BMPs to manage stormwater runon and runoff from individual construction sites. Therefore, transportation network improvements would not result in impacts associated with impeding or redirecting flood flows.

Current design practices are employed in accordance with local HMPs; Caltrans standards; and other related regulations and programs, including FHWA, FTA, and Caltrans policies on adapting to climate change, sea-level rise, and flooding. Similar engineering standards exist for properly controlling and conveying surface runoff and surface waters when drainage modifications are necessary for project implementation. Caltrans drainage designs would conform to the Highway Design Manual (Caltrans 2019), which requires the following design flood criteria:

- Roadway storm drain system and the freeway shoulder must be able to safely drain the 25-year return interval storm.
- Culverts must be designed to convey the 10-year interval storm (without causing the headwater elevation to rise above the inlet top of the culvert); and convey the 100-year interval storm without headwaters rising above an elevation that would cause objectionable backwater depths or outlet velocities.

The County of San Diego requires transportation projects in unincorporated areas to be designed to convey 50-year design storm peak runoff volumes within the project drainage system and to be capable of conveying 100-year floodwaters without exceeding curb height or damaging structures along the right-of-way (County of San Diego 2014b). In addition, HMP regulations as well as the Municipal Stormwater Permit (Order R9-2013-0001) require that priority development projects maintain pre-development hydrology. As a result, additional runoff volumes and peak flow discharges from impervious areas, such as freeways, must be attenuated to maintain hydrological conditions and not exceed stormwater conveyance capacities. LID is commonly applied to achieve this requirement. By incorporating these types of prescriptive design standards in compliance with regulatory requirements, surface runoff patterns and flooding associated with transportation network

improvements would be controlled. Through the various hydromodification requirements that would be in place, the transportation network improvements would maintain pre-development hydrology. Therefore, transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns or impede or redirect flood flows such that flood risk would increase by 2025. This impact is less than significant.

2025 Conclusion

Compliance with regulatory requirements and implementation of similar design measures, as described above and in Section 4.10.2, would ensure that regional growth and land use changes as well as transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns or impede or redirect flood flows such that flood risk would increase. Through the various requirements to incorporate hydromodification and LID measures, the proposed Plan would maintain pre-development hydrology, and would reduce, infiltrate, and properly manage stormwater runoff. Therefore, this impact (HWQ-3) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change

Similar to the 2025 analyses and as discussed in Impact HWQ-2, regional growth and land use change associated with the proposed Plan would change drainage patterns, increase impervious surface area, add pollutant sources, and reduce natural, undeveloped landscape. Development forecasted on vacant land, open space, and agricultural land, mainly in rural areas in San Diego County, would cause greater increases in impervious surfaces and impeded or redirected flood flows than infill and redevelopment. Impacts would be greater by 2035 than by 2025 as more development or redevelopment activities would occur in coastal communities, desert portions of the region, or near areas with canyons and hills, including parts of the City of San Diego.

Such changes would be closely regulated by the federal, State, and local laws described earlier such as the Construction General Permit, which would require the implementation of BMPs during construction to minimize runoff from the construction site and reduce the potential for any on- or offsite flooding or impeded or redirected flood flows. Following construction completion, development projects would be required to maintain pre-development hydrology in compliance with hydromodification requirements similar to those currently prescribed in the Municipal Stormwater Permit (Order R9-2013-0001). Runoff from operation of future development would be required to be mitigated and treated through recommended LID, site design, and/or structural BMPs. As with 2025 requirements, LID measures such as detention basins, infiltration strips, and porous paving for development projects would be mandatory to mitigate stormwater runoff impacts. These measures would reduce or avoid hydromodification effects and flooding impacts. By incorporating these prescriptive design standards in compliance with regulatory requirements into development projects associated with regional growth and land use change, surface runoff patterns and flooding would be controlled. Through the requirements to incorporate hydromodification measures, the regional growth and land use changes would maintain pre-development hydrology. Therefore, development associated with regional growth and land use change would not substantially alter existing drainage patterns or impede or redirect flood flows such that flood risk would increase by 2035. This impact is less than significant.

Transportation Network Improvements and Programs

Similar to the 2025 analyses and as discussed in Impact HWQ-2, the proposed transportation network improvements would result in alterations to drainage patterns without the incorporation of appropriate BMPs. Some of these improvements and programs may involve major grading or earthwork, resulting in temporary or permanent changes to existing drainage patterns. By incorporating the required design standards and complying with all applicable regulations, changes to surface runoff patterns, drainage patterns, and runoff flows would be substantially lessened. No structures apart from bridge pilings are anticipated to be added associated with transportation network improvements that could redirect or exacerbate existing flood flows. Required design practices (e.g., municipal HMPs, Caltrans standards, FHWA and FTA policies) mandate that engineered conveyances (whether hardscaped or soft bottom) integrate energy dissipation protection and other suitable design controls to eliminate or substantially lessen flooding risk. Through the various hydromodification requirements that would be in place, the transportation network improvements would maintain pre-development hydrology. Therefore, transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns or impede or redirect flood flows such that flood risk would increase by 2035. This impact is less than significant.

2035 Conclusion

Compliance with regulatory requirements and implementation of similar design measures, as described above and in Section 4.10.2, would ensure that regional growth and land use changes as well as transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns or impede or redirect flood flows such that flood risk would increase. Through the various requirements to incorporate hydromodification and LID measures, the proposed Plan would maintain pre-development hydrology, and would reduce, infiltrate, and properly manage stormwater runoff such that on- or offsite flooding would not occur. Therefore, this impact (HWQ-3) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change

Similar to the 2025 and 2035 analyses and as discussed in Impact HWQ-2, regional growth and land use change associated with the proposed Plan would change drainage patterns, increase impervious surface area, add pollutant sources, and reduce natural, undeveloped landscape. Plan-related projects would need to comply with a variety of regulatory requirements for controlling floodwater, as well as design standards and other applicable regulations to reduce flooding impacts. Construction-related flooding impacts would generally be addressed through compliance with the Construction General Permit. For projects disturbing more than 1 acre, a SWPPP and associated BMPs would be implemented to control and minimize runoff, thereby reducing the potential for on- or offsite flooding or impeded or redirected flood flows.

Operations and maintenance for development projects would be required to maintain pre-development hydrology in compliance with enforced hydromodification requirements, similar to requirements in the Municipal Stormwater Permit (Order R9-2013-0001), which would require LID, onsite design, and/or offsite structural BMPs. Through the requirements to incorporate hydromodification measures, the regional growth and land use changes would maintain pre-development hydrology. Therefore, development associated with regional growth and land use change would not substantially alter existing drainage patterns or impede or redirect flood flows such that flood risk would increase by 2050. This impact is less than significant.

Transportation Network Improvements and Programs

Similar to the 2025 and 2035 analyses, and as discussed in Impact HWQ-2, the proposed transportation network improvements by 2050 would result in alterations to drainage patterns without the incorporation of the appropriate BMPs. Transportation network improvements and programs proposed under the proposed Plan would be required to conform to and comply with water quality protection regulations and, as such, would employ necessary flood control measures into their respective designs. Changes to surface runoff patterns, drainage patterns, and flows would be substantially less as a result. No structures apart from bridge pilings are anticipated to be added associated with transportation network improvements that could redirect or exacerbate existing flood flows. Required design practices (e.g., municipal HMPs, Caltrans standards, FHWA and FTA policies) would be implemented to eliminate or substantially reduce increased risk of flooding.

By incorporating design standards in compliance with regulatory requirements, surface runoff patterns and flooding associated with transportation network improvements would be controlled. Through the various hydromodification requirements that would be in place, the transportation network improvements would maintain pre-development hydrology. Therefore, transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns or impeded or redirected flood flows such that flood risk would increase by 2050. This impact is less than significant.

2050 Conclusion

Compliance with regulatory requirements and implementation of similar design measures, as described above and in Section 4.10.2, would ensure that regional growth and land use changes as well as transportation network improvements associated with the proposed Plan would not substantially alter existing drainage patterns or impede or redirect flood flows such that flood risk would increase. Through the various requirements to incorporate hydromodification and LID measures, the proposed Plan would maintain pre-development hydrology, and would reduce, infiltrate, and properly manage stormwater runoff such that on- or offsite flooding would not occur. Therefore, this impact (HWQ-3) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change impacts related to alteration of drainage patterns as described in Section 4.10.1, the proposed Plan would not exacerbate climate change effects on drainage patterns if development and transportation projects implementing the proposed Plan remain in compliance with existing and evolving regulatory requirements controlling surface runoff patterns and floodwater, as well as design standards (i.e., hydromodification and LID measures) and other applicable regulations to reduce impacts, assuming that these requirements incorporate consideration of future climate change projections.

HWQ-4 SUBSTANTIALLY INCREASE RISK OF POLLUTION RELEASE DUE TO INUNDATION OF A FLOOD HAZARD, TSUNAMI, OR SEICHE ZONE.

ANALYSIS METHODOLOGY

Pursuant to the Supreme Court case decision in *California Building Industry Association v. Bay Area Air Quality Management District (2015)* 62 Cal. 4th 369, CEQA generally does not require an analysis of how the existing environmental conditions would affect a project's residents or users unless the project would exacerbate those conditions, such as possible project impacts from an area prone to flooding from tsunami or seiche. If a project would potentially exacerbate the hazard, then factual determination must be whether the exacerbation would or would not be significant, incrementally or cumulatively.

This section analyzes areas proposed for growth and land use change and transportation network improvements that occur near the San Diego region's coastline, which would be subjected to hazards resulting from flooding, tsunamis, or seiches. In addition, this section analyzes inland areas proposed for growth and land use change and transportation network improvements that occur near surface water resources, such as streams and rivers, that are subject to flooding. Flooding, tsunami, and seiche hazard areas from local general plans or other data sources are referenced in this section such that the proposed Plan can be evaluated to determine if any forecasted regional growth and land use change or planned transportation network improvements or programs would occur within the hazard areas identified. Hazard areas associated with seiches include large enclosed or partially enclosed water bodies, such as reservoirs, coastal bays and lakes. Tsunami hazard areas occur along the coastline; however, some areas are protected by the coastal formations and offshore islands. In addition, surface water streams and rivers are also subject to flooding and inundation. Where proposed Plan components may occur within flood, tsunami or seiche zones, appropriate precautions, design standards, and other methods to protect the public and structures are referenced and discussed. Implementation of the proposed Plan would have a significant impact related to flooding, tsunami, and seiche hazard areas if forecasted regional growth and land use change or planned transportation network improvements under the proposed Plan exacerbates the potential for flooding or inundation conditions, resulting in an increased risk of pollutants being released due to inundation.

Seiches and tsunamis are rare events that are typically caused by geologic factors such as earthquakes. As such, it would be rare for a project to exacerbate the issue and result in inundation. A new project that might result in the risk of pollutant release due to inundation would likely be limited to industrial projects that use significant amounts of chemicals in industrial processes or store chemical outdoors that could be washed away in the event of flooding from tsunami or seiche. This section will evaluate the potential for these proposed land use changes to be inundated by flooding and potential risk of release of pollutants. Forecasted regional growth and planned transportation network improvements and programs would not result in an increased risk of pollutants being released due to inundation given that pollutants are unlikely to be stored in large quantities that would result in release during inundation, and therefore are not analyzed further.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Approximately 78.8 percent of the 2016 to 2025 population growth would occur within the City of San Diego, City of Chula Vista, and City of Escondido. Development with project footprints that lie in low elevations directly adjacent to the coast would be susceptible to tsunami, including coastal areas within the Cities of San Diego and Chula Vista. Tsunami inundation areas occur along the entire coastline from the California-Mexico border to north of Oceanside (California Department of Conservation 2013). However, as described in Section 4.10.1, *Existing Conditions,* the risk of tsunamis in the San Diego region is low. In 92 years of record, at least 19 tsunamis have been recorded in the San Diego region, with most only a few tenths of a meter in height. (Agnew 2009). There is no historical precedence for large damaging seiches in the San Diego region; therefore the risk of seiches affecting regional growth and land use change development projects would be expected to be low.

Although the risk of tsunami and seiche and the associated risk of pollution release is considered low in the San Diego region, development under the proposed Plan would occur in areas subject to these hazards. During construction activities, stormwater BMPs would be implemented, as required by federal, State, county, and local policies to minimize degradation of water quality associated with stormwater runoff or construction-

related pollutants. Compliance with regional, State, and federal water quality regulations would ensure that the increased runoff volume and pollutant generation from development are addressed. Construction activities and operation would comply with local stormwater ordinances, stormwater requirements established by the Municipal Stormwater Permit, and regional waste discharge requirements. Prior to flood events, measures such as sandbag barriers and gravel bag berms would be implemented and maintained to reduce the risk of pollutant release. Post-construction BMPs and measures to reduce the risk of pollutants in a storm event are discussed under Impact HWQ-1 in the 2025 analysis. Further, runoff for post-construction operations would be managed through LID, onsite design, and/or offsite structural BMPs. As discussed under Impact HWQ-2, LID and incorporation of natural spaces, such as detention basins, infiltration strips, and porous paving, that reduce, infiltrate, and manage stormwater runoff flows would be required for all new developments. These measures would be required to substantially lessen runoff from development thereby avoiding adverse hydromodification and flooding impacts.

Compliance with enforced planning and design standards, regulations, and safety ordinances would serve to address and minimize the release of pollutants due to inundation in a flood hazard, tsunami, or seiche zone. Planning and design of development projects would be required to incorporate safety policies from the County of San Diego General Plan Seismic Safety Element to reduce the risk associated with tsunami or seiche hazards. State planning and zoning law requires a Seismic Safety Element (City of San Diego 2015b) of all City and County General Plans that identifies and appraises hazards including the effects of seismically-induced waves such as tsunamis and seiches. The Seismic Safety Element serves to reduce the risk of hazard resulting from future seismic and related events. The magnitude of seismic risk and associated release of pollutants is related to local seismic conditions as well as implementation of effectiveness measures and practices to reduce the risk of pollutant release. The Seismic Safety Element identifies seismic and other geologic hazards, while offering land-use–related guidelines related to seismic risk zones.

The regional growth and land use changes associated with the proposed Plan that are located within the existing floodplains, including the Cities of San Diego and Chula Vista and the County of San Diego, would be impacted by a 100-year flood if appropriate design measures are not incorporated. Table 4.10-7 shows the land use types within each municipality in the San Diego region that encroach upon the 100-year floodplain for 2025. Each land use type included in the table reflects a parcel whose land use type is proposed to change in the proposed Plan by 2025.

Table 4.10-7
2025 Land Use Types in the 100-year Floodplain

Land Use Type	Municipality
Agriculture	Carlsbad, Encinitas, Escondido, Oceanside, Poway, County of San Diego, San Diego, San Marcos
Commercial and Office	Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Solana Beach, Vista
Education and Institutions	Carlsbad, Chula Vista, El Cajon, Encinitas, Escondido, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Vista
Heavy and Light Industry	Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Escondido, Imperial Beach, Lemon Grove, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Vista
Military	Coronado, Imperial Beach, National City, County of San Diego, San Diego

Land Use Type	Municipality
Mixed Use	Carlsbad, Chula Vista, Coronado, Del Mar, Escondido, Imperial Beach, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Vista
Mobile Homes	Carlsbad, Chula Vista, El Cajon, Escondido, La Mesa, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Vista
Multi-Family Residential	Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, Lemon Grove, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Solana Beach, Vista
Open Space Parks	Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, County of San Diego, San Marcos, Santee, Solana Beach, Vista
Recreation	Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Solana Beach, Vista
Single Family Residential	Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Solana Beach, Vista
Spaced Rural Residential	Carlsbad, Chula Vista, Del Mar, Encinitas, Escondido, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Vista
Transportation, Communications, Utilities	Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Solana Beach, Vista
Under Construction	Carlsbad, Chula Vista, Coronado, Encinitas, Imperial Beach, National City, Oceanside, County of San Diego, San Diego, Santee, Vista
Vacant	Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Solana Beach, Vista
Water	Carlsbad, Chula Vista, Coronado, Del Mar, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, County of San Diego, San Diego, Santee, Solana Beach

Source: FEMA 2019.

All drainage designs would be required to conform to the flood control requirements of the applicable jurisdiction. Public drainage facilities in unincorporated areas would be designed to convey the peak discharge of the 50-year flood event within the underground piping and the 100-year flood event to the top of the curb without damage to property adjacent to the right-of-way (County of San Diego 2014a). Culverts in public roads would be designed to convey the peak discharge from the 100-year flood event. Compliance with local floodplain management ordinances (e.g., County of San Diego Flood Damage Prevention Ordinance) and water quality requirements (e.g. regional waste discharge requirements) would be required for all development projects to minimize flood hazards and associated release of pollutants. Flood ordinances include requirements for reducing flood losses, including restricting uses that are dangerous to health, safety, and property due to erosion or water hazards; requiring uses vulnerable to floods to be protected against flood damage at the time of construction; controlling the alteration of natural floodplains; controlling filling, grading, or dredging that may increase flood damage; and preventing construction of flood barriers that will divert flood waters or increase flood hazards in other areas. Flood ordinances also include design standards for abutments to prevent collapse or lateral movement during a 100-year flood.

Development under the proposed Plan would occur in areas subject to inundation hazards from failure of a dam or levee, including coastal areas within the City of San Diego and areas downstream of Lake Murray, Sweetwater Reservoir, and Lower Otay Lake. Planning and design of development projects would be required to incorporate safety policies from the County of San Diego General Plan Safety Element to reduce the risk of damage associated with dam or levee failure.

Project designs and review approvals would include reference to the Seismic Safety Element, California Department of Conservation maps (California Department of Conservation 2013) showing tsunami inundation areas, FEMA maps, and other pertinent resources to determine at-risk areas such that proposed projects are safely designed in coastal and rough terrain areas. By incorporating the required design standards and complying with all applicable regulations and safety ordinances outlined above and in Section 4.10.2, storm flows would be controlled, substantially reducing flood hazards. Mandatory BMPs would be implemented to manage and substantially reduce pollutant release in a flood event. Through the various requirements to incorporate floodplain management, safety ordinances, and treatment BMPs, the risk of pollutant release due to inundation by flood hazard, tsunami, or seiche would be minimized. Therefore, the regional growth and land use change would not substantially increase the risk of pollutant release due to inundation in a flood hazard, tsunami, or seiche zone. This impact is less than significant.

Transportation Network Improvements and Programs

Similar to regional growth and land use changes, the transportation network improvements in place by 2025 are located in or near coastal areas. Project footprints that lie in low elevations directly adjacent to the coast would be susceptible to tsunami, including coastal areas within the City of San Diego. However, the risk of tsunamis in the San Diego region is low. There is no historical precedence for large damaging seiches in the San Diego region; therefore the risk of seiches and associated risk of pollutant release affecting transportation network improvements would be low. Although the risk of tsunami and seiche is low in the San Diego region, projects would be designed to convey 100-year flood waters, which would also sufficiently convey seiche or tsunami flows within these design parameters. In addition, planning and design of transportation network improvements would be required to incorporate safety policies from the Seismic Safety Element to reduce the risk of property damage associated with tsunami and seiche hazards. Project designs and review approvals would include reference to the Seismic Safety Element, California Department of Conservation maps showing tsunami inundation areas, FEMA maps, and other pertinent resources to determine at-risk areas such that proposed projects are safely designed in coastal areas.

Transportation network improvements within 100-year flood hazard areas, including mostly local roadway and arterial improvements, would be exposed to flood hazards without the appropriate design measures. Table 4.10-8 shows the transportation network improvements planned for 2025 that would encroach upon 100-year floodplains. Design standards and protocols (defined in Section 4.10.2 above) require analysis of floodplain exposure and impacts on people and structures, including flooding that may result from climate change. Design practices employed in accordance with the local HMP; Caltrans standards; and other related regulations and programs, including FHWA, FTA, and Caltrans policies on adapting to climate change, sea-level rise, and flooding, would be required. Compliance with local floodplain management ordinances (e.g., County of San Diego Flood Damage Prevention Ordinance) would be required for all transportation network improvement projects to minimize public and private losses due to flood conditions. Flood ordinances would include requirements for reducing flood hazards, including restricting uses that are dangerous to health, safety, and property due to erosion or water hazards; requiring uses vulnerable to floods and associated pollutant release to be protected against flood damage at the time of construction; controlling the alteration of natural floodplains; controlling filling, grading, or dredging that may increase flood damage and adverse water quality

impacts; and preventing construction of flood barriers that will divert flood waters or increase flood hazards and conveyance of pollutants to other areas. Flood ordinances also include design standards for abutments to prevent collapse or lateral movement during a 100-year flood.

Any additional runoff and associated pollutants from new or improved transportation facilities would be conveyed to downstream flood control structures while protecting associated waterbodies from adverse water quality impacts. Prior to flood events, measures such as sandbag barriers and gravel bag berms would be implemented and maintained to reduce the risk of pollutant release. Post-construction BMPs would consider natural stormwater quality treatment and would include LID, hydromodification measures, and revegetation efforts. In addition, construction and operations would comply with local stormwater ordinances, stormwater requirements established by the Municipal Stormwater Permit, and regional waste discharge requirements.

Table 4.10-8
2025 Transportation Network Improvements in the 100-year Floodplain

Improvement Type	Improvement
Active Transportation	Inland Rail Trail: Phase 4
Local Improvements – RAS	San Diego River Trail: Carlton Oaks Segment
Local Improvements – RAS	Citracado Parkway II
Local Improvements – RAS	College Boulevard Improvements from Avenida de la Plate to Waring Road
Local Improvements – RAS	Discovery St. from Craven to Twin Oaks #ST007
Local Improvements – RAS	El Camino Real and Cannon Road
Local Improvements – RAS	El Camino Real Widening – La Costa Avenue to Arenal Road
Local Improvements – RAS	Plaza Blvd Widening
Local Improvements – RAS	San Marcos Creek Specific Plan – Discovery Street Widening and Flood Control Improvements #88265
Local Improvements – Street and Road	Grand Avenue Bridge and Street Improvements
Local Improvements – Street and Road	San Marcos Creek Specific Plan: Creekside Drive and Pad Grading #88505
Local Improvements – Street and Road	Via Vera Cruz Bridge and Street Improvements #88264
Ops/Maintenance – Highway Bridge Program	El Camino Real
Ops/Maintenance – Highway Bridge Program	Heritage Road Bridge
Ops/Maintenance – Highway Bridge Program	West Mission Bay Drive Bridge

Transportation network improvements under the proposed Plan would also occur in areas subject to inundation hazards from failure of a dam or levee. Though more dams exist in the region, these are large reservoirs that would produce large volumes of water if a dam were to fail. Cal OES dam inundation maps and LFPZ maps would be reviewed for all projects associated with transportation network improvements of the proposed Plan to determine the extent of inundation for at-risk areas in the event of a dam or levee failure, respectively. Planning and design of transportation network improvements would be required to incorporate safety policies from the County of San Diego General Plan Safety Element to reduce the risk of dam or levee failure hazards and associated pollutant release.

By incorporating the required design standards and complying with all applicable regulations and ordinances outlined above and in Section 4.10.2, impacts associated with release of pollutants due to inundation of a flood hazard, tsunami, or seiche zone would be minimized. Through the various requirements to incorporate floodplain management, safety ordinances, and treatment BMPs, runoff would be controlled and flooding hazards would be substantially reduced and the risks associated with tsunami and seiche hazards would be minimized. Safety policies from the Seismic Safety Element would reduce the risk of property damage associated with tsunami and seiche hazards. Therefore, the transportation network improvements would not substantially increase the risk of pollutant release due to inundation of a flood hazard, tsunami, or seiche zone. This impact is less than significant.

2025 Conclusion

Compliance with applicable regulatory requirements and implementation of design measures, safety ordinances, and water quality requirements described above and in Section 4.10.2 would ensure that regional growth and land use changes as well as transportation network improvements would minimize the release of pollutants due inundation of a flood hazard, tsunami, or seiche zone. Through the various requirements to incorporate floodplain management, safety ordinances, and treatment BMPs, the proposed Plan would not substantially increase the risk of pollutant release due to inundation in a flood hazard, tsunami, or seiche zone. Therefore, this impact (HWQ-3) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change

Approximately 78 percent of the 2026 to 2035 population growth would occur in the City of San Diego (71 percent) and City of National City (7 percent). Development with project footprints that lie in low elevations directly adjacent to the coast would be susceptible to tsunami, including coastal areas within the Cities of San Diego and Chula Vista (tsunami inundation areas occur along the entire coastline from the California-Mexico border to north of Oceanside [California Department of Conservation 2013]). However, the risk of tsunamis in the San Diego region is low. In 92 years of record, at least 19 tsunamis have been recorded in the San Diego region (Agnew 2009). There is no historical precedence for large damaging seiches in the San Diego region; therefore the risk of seiches affecting regional growth and land use change development projects would be expected to be low.

Although the risk of tsunami and seiche and the associated risk of pollution release is considered low in the San Diego region, development under the proposed Plan would occur in areas subject to these hazards. During construction activities, stormwater BMPs would be implemented, as required by federal, State, county, and local policies to minimize degradation of water quality associated with stormwater runoff or construction-related pollutants. Compliance with regional, State, and federal water quality regulations would ensure that the increased runoff volume and pollutant generation from development are addressed. Construction activities and operation would comply with local stormwater ordinances, stormwater requirements established by the Municipal Stormwater Permit, and regional waste discharge requirements. Prior to flood events, measures such as sandbag barriers and gravel bag berms would be implemented to reduce the risk of pollutant release. Post-construction BMPs and measures to reduce the risk of pollutants and mange runoff in a storm event are discussed under Impact HWQ-1 and HWQ-2 in the 2025 analysis, respectively. Runoff for post-construction operations would be managed through LID, which is required for all new developments, onsite design, and/or offsite structural BMPs. These measures would be required to

substantially lessen runoff from development thereby avoiding adverse hydromodification and flooding impacts.

Compliance with enforced planning and design standards, regulations, and safety ordinances would serve to address and minimize the release of pollutants due to inundation in a flood hazard, tsunami, or seiche zone. Planning and design of development projects would be required to incorporate safety policies from the County of San Diego General Plan Seismic Safety Element to reduce the risk associated with tsunami and seiche hazards. State planning and zoning law requires a Seismic Safety Element (City of San Diego 2015b) of all City and County General Plans that identifies and appraises hazards including the effects of seismically-induced waves such as tsunamis and seiches.

The regional growth and land use changes associated with the proposed Plan that are located within the existing floodplains, including the Cities of San Diego and Chula Vista and the County of San Diego, would be impacted by a 100-year flood if appropriate design measures are not incorporated. Table 4.10-9 shows the proposed land use types that encroach upon the 100-year floodplain through 2035. Additional development would occur in coastal areas under the proposed Plan and these areas are most susceptible to flooding. However, as discussed in the 2025 analysis, drainage designs would be made to conform to the flood control requirements of the applicable jurisdiction, including any applicable information regarding flooding resulting from climate change that would occur in the long term (e.g., the year 2050). Design practices employed in accordance with the local HMPs, Caltrans standards, and other related regulations and programs related to flooding, would be required. Compliance with local floodplain management ordinances (e.g., County of San Diego Flood Damage Prevention Ordinance) and water quality requirements (e.g. regional waste discharge requirements) would be required for all development projects to minimize hazards due to flood conditions and associated release of pollutants.

Table 4.10-9
2035 Land Use Types in the 100-year Floodplain

Land Use Type	Municipality
Airstrip	County of San Diego
Arterial Commercial	Carlsbad, Chula Vista, Coronado, El Cajon, Encinitas, Escondido, Imperial Beach, Lemon Grove, National City, Oceanside, Poway, County of San Diego, San Diego. San Marcos, Santee, Solana Beach, Vista
Automobile Dealership	Chula Vista, El Cajon, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Vista
Bay or Lagoon	Carlsbad, Chula Vista, Coronado, Del Mar, Encinitas, Imperial Beach, National City, Oceanside, San Diego, Solana Beach
Beach – Active	Carlsbad, Coronado, Encinitas, Imperial Beach, Oceanside, County of San Diego, San Diego, Solana Beach
Beach – Passive	Carlsbad, Coronado, Del Mar, Encinitas, Imperial Beach, Oceanside, San Diego, Solana Beach
Casino	County of San Diego
Cemetery	County of San Diego, San Diego
Commercial	Chula Vista, Coronado, Del Mar, El Cajon, Escondido, Lemon Grove, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Solana Beach, Vista
Commercial Recreation	Oceanside, County of San Diego, San Diego, San Marcos

Land Use Type	Municipality
Commercial Under Construction	National City, Vista
Communications and Utilities	Carlsbad, Chula Vista, Coronado, Del Mar, Encinitas, Escondido, National City, Oceanside, County of San Diego, San Diego, San Marcos, Vista
Community Shopping Center	Chula Vista, Encinitas, Escondido, Oceanside, County of San Diego, San Diego, San Marcos, Santee, Vista
Convention Center	San Diego
Dormitory	San Diego
Elementary School	Chula Vista, Escondido, National City, Oceanside, Poway, County of San Diego, San Diego, Santee
Extractive Industry	Chula Vista, Coronado, Imperial Beach, National City, Poway, County of San Diego, San Diego, Santee
Field Crops	Carlsbad, Encinitas, Escondido, Oceanside, Poway, County of San Diego, San Diego, San Marcos
Fire/Police Station	Chula Vista, Escondido, Oceanside, Poway, County of San Diego, San Marcos, Vista
Freeway	Carlsbad, Chula Vista, Coronado, El Cajon, Encinitas, Escondido, La Mesa, Lemon Grove, National City, Oceanside, County of San Diego, San Diego, San Marcos, Santee, Vista
General Aviation Airport	El Cajon, Oceanside, County of San Diego
Golf Course	Carlsbad, Chula Vista, Coronado, Escondido, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee
Golf Course Clubhouse	Chula Vista, National City, County of San Diego, San Diego
Government Office/Civic Center	County of San Diego, San Diego
Group Quarters	San Diego
Heavy Industry	National City, San Diego
Hospital – General	San Diego
Hospitals	Chula Vista, San Diego
Hotel/Motel (High-Rise)	San Diego
Hotel/Motel (Low-Rise)	Carlsbad, Chula Vista, Del Mar, El Cajon, Imperial Beach, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Vista
Hotel/Motel/Resort	Carlsbad, National City, San Diego
Industrial Park	Carlsbad, Chula Vista, El Cajon, Escondido, Oceanside, County of San Diego, San Diego, San Marcos, Santee, Vista
Industrial Under Construction	County of San Diego, San Diego
Intensive Agriculture	Carlsbad, Encinitas, Escondido, Oceanside, Poway, County of San Diego, San Diego, San Marcos
Jail/Prison	Santee
Junior College	Escondido, San Diego
Junior High School or Middle School	Carlsbad, El Cajon, Escondido, Oceanside County of San Diego, San Diego
Junkyard/Dump/Landfill	Chula Vista, Oceanside, County of San Diego, San Diego

Land Use Type	Municipality
Lake/Reservoir/Large Pond	Chula Vista, Escondido, National City, Oceanside, Poway, S.D. County, San Diego, Santee
Landscape Open Space	Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, S.D. County, San Diego, San Marcos, Santee, Solana Beach, Vista
Library	National City, S.D. County
Light Industry	Chula Vista, El Cajon, Escondido, Imperial Beach, Lemon Grove, National City, Oceanside, S.D. County, San Diego, San Marcos, Vista
Light Industry – General	Chula Vista, Del Mar, Lemon Grove, National City, Oceanside, S.D. County, San Diego, San Marcos, Santee, Vista
Marina	Chula Vista, Coronado, National City, Oceanside, San Diego
Marine Terminal	National City, San Diego
Military Training	County of San Diego, San Diego
Military Use	Coronado, County of San Diego, Imperial Beach, National City, San Diego
Mission	Oceanside
Mixed Use	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, Escondido, Imperial Beach, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
Mobile Home Park	Carlsbad, Chula Vista, County of San Diego, El Cajon, Escondido, La Mesa, National City, Oceanside, Poway, San Diego, San Marcos, Vista
Multi-Family Residential	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
Multi-Family Residential Without Units	Chula Vista, County of San Diego Escondido, Imperial Beach, National City, Oceanside, San Diego
Neighborhood Shopping Center	Carlsbad, Chula Vista, County of San Diego, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Vista
Office	County of San Diego, El Cajon, Escondido, San Diego, San Marcos
Office (Low-Rise)	Carlsbad, Chula Vista, County of San Diego, El Cajon, Encinitas, Escondido, La Mesa, Lemon Grove, National City, Poway, San Diego, San Marcos, Solana Beach, Vista
Open Space Park Or Preserve	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
Orchard Or Vineyard	County of San Diego, Escondido, Oceanside, Poway, San Diego, San Marcos
Other Group Quarters Facility	County of San Diego, El Cajon, Escondido, Oceanside, San Diego, Santee, Vista
Other Health Care	Chula Vista, County of San Diego, Escondido, San Diego, Vista
Other Public Services	Carlsbad, Chula Vista, County of San Diego, El Cajon, Escondido, Poway, San Diego, Vista
Other Recreation – High	Carlsbad, Chula Vista, Coronado, County of San Diego, El Cajon, Encinitas, Imperial Beach, National City, Oceanside, Poway, San Diego, Vista
Other Recreation – Low	County of San Diego, San Diego, Vista
Other Retail Trade And Strip	Chula Vista, Coronado, County of San Diego, El Cajon, Escondido, Imperial Beach, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Vista
Other School	County of San Diego, Escondido, National City, Poway, San Diego, San Marcos

Land Use Type	Municipality
Other Transportation	Carlsbad, Chula Vista, County of San Diego, Del Mar, Imperial Beach, Oceanside, San Diego
Other University Or College	San Diego
Park – Active	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Vista
Park And Ride Lot	Chula Vista, Escondido, Oceanside
Parking Lot – Structure	San Diego
Parking Lot – Surface	Coronado, Del Mar, Escondido, National City, Oceanside, San Diego, San Marcos, Vista
Parks	Chula Vista, Coronado, National City, Oceanside, Poway, San Diego, San Marcos
Post Office	County of San Diego, El Cajon, Escondido, Oceanside, San Diego
Public Services	Carlsbad, Chula Vista, County of San Diego, San Diego
Public Storage	Chula Vista, County of San Diego, El Cajon, Escondido, Oceanside, San Diego, San Marcos, Vista
Racetrack	County of San Diego, Del Mar, San Diego
Rail Station/Transit Center	County of San Diego, Oceanside, San Diego
Railroad Right Of Way	Carlsbad, Chula Vista, County of San Diego, Del Mar, El Cajon, Encinitas, National City, Oceanside, San Diego, San Marcos, Solana Beach, Vista
Regional Shopping Center	Carlsbad, County of San Diego, Escondido, National City, Oceanside, San Diego
Religious Facility	Chula Vista, County of San Diego, Encinitas, Escondido, Oceanside, Poway, San Diego, San Marcos, Santee, Vista
Residential Recreation	Carlsbad, Chula Vista, Coronado, County of San Diego, Oceanside, San Diego, Santee, Vista
Residential Under Construction	Carlsbad, Chula Vista, County of San Diego, Encinitas, Imperial Beach, Oceanside, San Diego, Santee
Resort	Carlsbad, Coronado, County of San Diego, Oceanside, San Diego, Solana Beach
Road Right Of Way	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
School District Office	County of San Diego, Escondido, San Diego, San Marcos
Schools	Carlsbad, Chula Vista, County of San Diego, Encinitas, Escondido, National City, San Diego, San Marcos, Vista
SDSU/CSU San Marcos/UCSD	San Diego
Senior High School	County of San Diego, El Cajon, Escondido, Oceanside, San Diego
Service Station	Carlsbad, Chula Vista, Encinitas, Escondido, National City, Oceanside, San Diego, Solana Beach, Vista
Single Family Detached	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
Single Family Multiple-Units	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista

Land Use Type	Municipality
Single Family Residential	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Oceanside, Poway, San Diego, Santee, Solana Beach, Vista
Single Family Residential Without Units	Carlsbad, Coronado, County of San Diego, Del Mar, Encinitas, Escondido, Oceanside, Poway, San Diego, San Marcos, Solana Beach, Vista
Spaced Rural Residential	Carlsbad, Chula Vista, County of San Diego, Del Mar, Encinitas, Escondido, Oceanside, Poway, San Diego, San Marcos, Santee, Vista
Spaced Rural Residential Without Units	County of San Diego
Specialty Commercial	Coronado, Del Mar, San Diego
Stadium/Arena	San Diego
Tourist Attraction	San Diego
UCSD/VA Hospital/Balboa Hospital	San Diego
Undevelopable Natural Area	Coronado, County of San Diego, Oceanside, San Diego
Vacant And Undeveloped Land	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, S.D. County, San Diego, San Marcos, Santee, Solana Beach, Vista
Warehousing	Chula Vista, County of San Diego, Lemon Grove, National City, Oceanside, Poway, San Diego
Water	Coronado, County of San Diego, Encinitas, Imperial Beach, Oceanside, San Diego
Wholesale Trade	County of San Diego, Chula Vista, Poway

Source: FEMA 2019.

Development under the proposed Plan would occur in areas subject to inundation hazards from failure of a dam or levee, including coastal areas within the City of San Diego and areas downstream of Lake Murray, Sweetwater Reservoir, and Lower Otay Lake. Cal OES dam inundation maps and LFPZ maps would be reviewed for all projects associated with development of the proposed Plan to determine the extent of inundation for at-risk areas in the event of a dam or levee failure, respectively. Planning and design of development projects would be required to incorporate safety policies from the County of San Diego General Plan Safety Element to reduce the risk of damage associated with dam or levee failure.

By incorporating the required design standards and complying with all applicable regulations and ordinances outlined above and in Section 4.10.2, storm flows would be controlled and flooding hazards would be substantially reduced. Mandatory BMPs would be implemented to manage and substantially reduce pollutant release in a flood event. Through the various requirements to incorporate floodplain management, safety ordinances, and treatment BMPs, the risk of pollutant release due to inundation by flood hazard, tsunami, or seiche would be minimized. Therefore, the regional growth and land use change would not substantially increase the risk of pollutant release due to inundation in a flood hazard, tsunami, or seiche zone. This impact is less than significant.

Transportation Network Improvements and Programs

Project footprints that lie in low elevations directly adjacent to the coast would be susceptible to tsunami, including coastal areas within the City of San Diego; however, the risk of tsunamis in the San Diego region is low. There is no historical precedence for large damaging seiches in the San Diego region; therefore the risk of

seiches and associated risk of pollutant release affecting transportation network improvements would be low. Although the risk of tsunami and seiche is low in the San Diego region, future transportation facilities would undergo a project-specific analysis in which required standards would be applied to minimize risks from seiche or tsunami. Projects would be designed to convey 100-year flood waters, which would also sufficiently convey seiche or tsunami flows within these design parameters. In addition, planning and design of transportation network improvements would be required to incorporate safety policies from the Seismic Safety Element to reduce the risk of property damage associated with tsunami and seiche hazards. Project designs and review approvals would include reference to the Seismic Safety Element, CADC maps showing tsunami inundation areas, FEMA maps, and other pertinent resources to determine at-risk areas such that proposed projects are safely designed in coastal areas.

Transportation network improvements within 100-year flood hazard areas, including Managed Lanes improvements on I-5, I-805, and I-15, among others; Transit Leap improvements; and Active Transportation and Demand Management, would be exposed to flood hazards without the appropriate design measures. Table 4.10-10 shows the transportation network improvements planned for 2035 that would encroach upon the 100-year floodplain. Design protocols (defined in Section 4.10.2 above) require designers of transportation facilities to minimize the risk from flooding events, including flooding that may result from climate change. Design practices employed in accordance with the local HMP; Caltrans standards; and other related regulations and programs, including FHWA, FTA, and Caltrans policies on adapting to climate change, sea-level rise, and flooding, would be required. Compliance with local floodplain management ordinances (e.g., County of San Diego Flood Damage Prevention Ordinance) would be required for all transportation network improvement projects to minimize public and private losses due to flood conditions. Flood ordinance requirements are discussed under Impact HWQ-3 in the 2025 analysis. Any additional runoff and associated pollutants from new or improved transportation facilities would be conveyed to downstream flood control structures while protecting associated waterbodies from adverse water quality impacts. Prior to flood events, measures such as sandbag barriers and gravel bag berms would be implemented to reduce the risk of pollutant release. Post-construction BMPs would consider natural stormwater quality treatment and would include LID, hydromodification measures, and revegetation efforts. In addition, construction and operations would comply with local stormwater ordinances, stormwater requirements established by the Municipal Stormwater Permit, and regional waste discharge requirements.

Transportation network improvements under the proposed Plan would occur in areas subject to inundation hazards from failure of a dam or levee. Cal OES dam inundation maps and LFPZ maps would be reviewed for all projects associated with transportation network improvements of the proposed Plan to determine the extent of inundation for at-risk areas in the event of a dam or levee failure, respectively. Planning and design of development projects would be required to incorporate safety policies from the County of San Diego General Plan Safety Element to reduce the risk of dam or levee failure hazards and associated pollutant release.

By incorporating the required design standards and complying with all applicable regulations and ordinances outlined above and in Section 4.10.2, impacts associated with release of pollutants due to inundation of a flood hazard, tsunami, or seiche zone would be minimized. Through the various requirements to incorporate floodplain management, safety ordinances, and treatment BMPs, runoff would be controlled, flooding hazards would be substantially reduced, and the risks associated with tsunami and seiche hazards would be minimized. Therefore, the transportation network improvements would not substantially increase the risk of pollutant release due to inundation of a flood hazard, tsunami, or seiche zone. This impact is less than significant.

Table 4.10-10
2035 Transportation Network Improvements in the 100-year Floodplain

Improvement Type	Improvement
Complete Corridor: ML	SR 163 (I-8 to I-805)
Complete Corridor: ML	SR 52 (I-15 to Mast Boulevard)
Complete Corridor: ML	SR 52 (Mast Boulevard to SR 125)
Complete Corridor: ML	SR 78 (I-5 to Twin Oaks)
Complete Corridor: ML	SR 94 (I-15 to I-805)
Complete Corridor: ML	SR 94 (I-5 to I-15)
Complete Corridor: ML	SR 94 (I-805 to SR 125)
Complete Corridor: ML/Goods Movement	I-15 (I-5 to I-805)
Complete Corridor: ML/Goods Movement	I-15 (I-8 to SR 163)
Complete Corridor: ML/Goods Movement	I-5 (H Street to Pacific Highway)
Complete Corridor: ML/Goods Movement	I-5 (I-805 to SR 56)
Complete Corridor: ML/Goods Movement	I-5 (Pacific Highway to SR 52)
Complete Corridor: ML/Goods Movement	I-5 (SR 52 to I-805)
Complete Corridor: ML/Goods Movement	I-5 (SR 905 to H Street)
Complete Corridor: ML/Goods Movement	I-805 (Balboa Avenue to NB Bypass Lane)
Complete Corridor: ML/Goods Movement	I-805 (H Street to I-15)
Complete Corridor: ML/Goods Movement	I-805 (I-15 to I-8)
Complete Corridor: ML/Goods Movement	I-805 (I-8 to Mesa College Drive)
Complete Corridor: ML/Goods Movement	I-805 (Mesa College Drive to Balboa Avenue)
Complete Corridor: ML/Goods Movement	I-805 (Palm Avenue to H Street)
Complete Corridor: MLC	I-5 (I-805)
Complete Corridor: MLC	I-5 (SR 15)
Complete Corridor: MLC	I-5 (SR 78)
Complete Corridor: MLC	I-805 (I-8)
Complete Corridor: MLC	I-805 (SR 163)
Complete Corridor: Rural	SR 76 (SR 76 to Pauma Reservation Road)
Transit Leap	Commuter Rail 582
Transit Leap	LRT 399
Transit Leap/Goods Movement	Commuter Rail 398
Transit Leap/Goods Movement	LRT 510
Active Transportation	Bayshore Bikeway: Segment 8B Main Street to Ada Street
Active Transportation	Central Coast Corridor
Active Transportation	Coastal Rail Trail – Rose Canyon
Active Transportation	Coastal Rail Trail Carlsbad
Active Transportation	Coastal Rail Trail Carlsbad – Reach 3 Tamarack to Cannon
Active Transportation	Coastal Rail Trail Del Mar
Active Transportation	Coastal Rail Trail Oceanside – Alta Loma Marsh bridge
Active Transportation	Coastal Rail Trail San Diego – Carmel Valley to Roselle via Sorrento

Improvement Type	Improvement
Active Transportation	Coastal Rail Trail San Diego – Del Mar to Sorrento via Carmel Valley
Active Transportation	Coastal Rail Trail San Diego – Mission Bay (Clairemont to Tecolote)
Active Transportation	Coastal Rail Trail San Diego – Pacific Highway (Fiesta Island Road to Taylor Street)
Active Transportation	Coastal Rail Trail San Diego – UTC to Rose Canyon
Active Transportation	I-15 Bikeway – Camino del Rio South to Rancho Mission Road
Active Transportation	I-15 Bikeway – Rancho Mission Road to Murphy Canyon Bike Path
Active Transportation	Inland Rail Trail: Oceanside
Active Transportation	San Diego River Bikeway Connections
Active Transportation	San Diego River Trail – Mast Park to Lakeside baseball park
Active Transportation	San Diego River Trail – Rancho Mission Road to Camino Del Rio North
Active Transportation	Santee – El Cajon Corridor
Local Improvements – RAS	College Boulevard Reach A

2035 Conclusion

Compliance with applicable regulatory requirements and implementation of design measures, safety ordinances, and water quality requirements described above and in Section 4.10.2 would ensure that regional growth and land use changes as well as transportation network improvements would minimize the release of pollutants due inundation of a flood hazard, tsunami, or seiche zone. Through the various requirements to incorporate floodplain management, safety ordinances, and treatment BMPs, the proposed Plan would not substantially increase the risk of pollutant release due to inundation in a flood hazard, tsunami, or seiche zone. Therefore, this impact (HWQ-3) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change

Approximately 78 percent of the 2036 to 2050 population growth would occur in the City of San Diego (37 percent), City of Chula Vista (28 percent) and City of San Marcos (13 percent). Project footprints that lie in low elevations directly adjacent to the coast would be susceptible to tsunami, including coastal areas within the Cities of San Diego and Chula Vista; however, the risk of tsunamis in the San Diego region is low. There is no historical precedence for large damaging seiches in the San Diego region; therefore the risk of seiches affecting regional growth and land use change development would be low.

Although the risk of tsunami and seiche and the associated risk of pollution release is considered low in the San Diego region, development under the proposed Plan would occur in areas subject to these hazards, such as the Cities of San Diego and Chula Vista. Construction activities and operation would comply with local stormwater ordinances, stormwater requirements established by the Municipal Stormwater Permit, and regional waste discharge requirements. Prior to flood events, measures would be implemented to reduce the risk of pollutant release. Compliance with enforced planning and design standards, regulations, and safety ordinances would

serve to address and minimize the release of pollutants due to inundation in a flood hazard, tsunami, or seiche zone. The Seismic Safety Element would reduce the risk of hazard resulting from future seismic and related events. Project designs and review approvals would include reference to the Seismic Safety Element, CADC maps showing tsunami inundation areas, FEMA maps, and other pertinent resources to determine at-risk areas such that proposed projects are safely designed in coastal areas.

The regional growth and land use changes associated with the proposed Plan that are located within the existing floodplains, including the Cities of San Diego and Chula Vista and the County of San Diego, would be impacted by a 100-year flood if appropriate design measures are not incorporated. Refer to Table 4.10-11 for the proposed changes in land use types that encroach upon the 100-year floodplain through 2050. However, as discussed in the 2025 and 2035 analyses, drainage designs would be made to conform to the flood control requirements of the applicable jurisdiction, including any applicable information regarding flooding resulting from climate change that would occur in the long term (e.g., the year 2050). Compliance with local floodplain management ordinances (e.g., County of San Diego Flood Damage Prevention Ordinance) and water quality requirements (e.g. regional waste discharge requirements) would be required for all development projects to minimize hazards due to flood conditions and associated release of pollutants. Planning and design of development projects would also be required to incorporate safety policies from the County of San Diego General Plan Safety Element to reduce the risk of damage associated with dam or levee failure.

By incorporating the required design standards and complying with all applicable regulations and ordinances outlined above and in Section 4.10.2, storm flows would be controlled and flooding hazards would be substantially reduced. Mandatory BMPs would be implemented to manage and substantially reduce pollutant release in a flood event. Through the various requirements to incorporate floodplain management, safety ordinances, and treatment BMPs, the risk of pollutant release due to inundation by flood hazard, tsunami, or seiche would be minimized. Therefore, the regional growth and land use change would not substantially increase the risk of pollutant release due to inundation in a flood hazard, tsunami, or seiche zone. This impact is less than significant.

Table 4.10-11
2050 Land Use Types in the 100-year Floodplain

Land Use Type	Municipality
Airstrip	County of San Diego
Arterial Commercial	Carlsbad, Chula Vista, Coronado, El Cajon, Encinitas, Escondido, Imperial Beach, Lemon Grove, National City, Oceanside, Poway, County of San Diego, San Diego. San Marcos, Santee, Solana Beach, Vista
Automobile Dealership	Chula Vista, El Cajon, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Vista
Bay or Lagoon	Carlsbad, Chula Vista, Coronado, Del Mar, Encinitas, Imperial Beach, National City, Oceanside, San Diego, Solana Beach
Beach – Active	Carlsbad, Coronado, Encinitas, Imperial Beach, Oceanside, County of San Diego, San Diego, Solana Beach
Beach – Passive	Carlsbad, Coronado, Del Mar, Encinitas, Imperial Beach, Oceanside, San Diego, Solana Beach
Casino	County of San Diego
Cemetery	County of San Diego, San Diego

Land Use Type	Municipality
Commercial	Chula Vista, Coronado, Del Mar, El Cajon, Escondido, Lemon Grove, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee, Solana Beach, Vista
Commercial Recreation	Oceanside, County of San Diego, San Diego, San Marcos
Commercial Under Construction	National City, Vista
Communications and Utilities	Carlsbad, Chula Vista, Coronado, Del Mar, Encinitas, Escondido, National City, Oceanside, County of San Diego, San Diego, San Marcos, Vista
Community Shopping Center	Chula Vista, Encinitas, Escondido, Oceanside, County of San Diego, San Diego, San Marcos, Santee, Vista
Convention Center	San Diego
Dormitory	San Diego
Elementary School	Chula Vista, Escondido, National City, Oceanside, Poway, County of San Diego, San Diego, Santee
Extractive Industry	Chula Vista, Coronado, Imperial Beach, National City, Poway, County of San Diego, San Diego, Santee
Field Crops	Carlsbad, Encinitas, Escondido, Oceanside, Poway, County of San Diego, San Diego, San Marcos
Fire/Police Station	Chula Vista, Escondido, Oceanside, Poway, County of San Diego, San Marcos, Vista
Freeway	Carlsbad, Chula Vista, Coronado, El Cajon, Encinitas, Escondido, La Mesa, Lemon Grove, National City, Oceanside, County of San Diego, San Diego, San Marcos, Santee, Vista
General Aviation Airport	El Cajon, Oceanside, County of San Diego
Golf Course	Carlsbad, Chula Vista, Coronado, Escondido, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Santee
Golf Course Clubhouse	Chula Vista, National City, County of San Diego, San Diego
Government Office/Civic Center	County of San Diego, San Diego
Group Quarters	San Diego
Heavy Industry	National City, San Diego
Hospital – General	San Diego
Hospitals	Chula Vista, San Diego
Hotel/Motel (High-Rise)	San Diego
Hotel/Motel (Low-Rise)	Carlsbad, Chula Vista, Del Mar, El Cajon, Imperial Beach, National City, Oceanside, Poway, County of San Diego, San Diego, San Marcos, Vista
Hotel/Motel/Resort	Carlsbad, National City, San Diego
Industrial Park	Carlsbad, Chula Vista, El Cajon, Escondido, Oceanside, County of San Diego, San Diego, San Marcos, Santee, Vista
Industrial Under Construction	County of San Diego, San Diego
Intensive Agriculture	Carlsbad, Encinitas, Escondido, Oceanside, Poway, County of San Diego, San Diego, San Marcos
Jail/Prison	Santee

Land Use Type	Municipality
Junior College	Escondido, San Diego
Junior High School or Middle School	Carlsbad, El Cajon, Escondido, Oceanside County of San Diego, San Diego
Junkyard/Dump/Landfill	Chula Vista, Oceanside, County of San Diego, San Diego
Lake/Reservoir/Large Pond	Chula Vista, Escondido, National City, Oceanside, Poway, S.D. County, San Diego, Santee
Landscape Open Space	Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, S.D. County, San Diego, San Marcos, Santee, Solana Beach, Vista
Library	National City, S.D. County
Light Industry	Chula Vista, El Cajon, Escondido, Imperial Beach, Lemon Grove, National City, Oceanside, S.D. County, San Diego, San Marcos, Vista
Light Industry – General	Chula Vista, Del Mar, Lemon Grove, National City, Oceanside, S.D. County, San Diego, San Marcos, Santee, Vista
Marina	Chula Vista, Coronado, National City, Oceanside, San Diego
Marine Terminal	National City, San Diego
Military Training	County of San Diego, San Diego
Military Use	Coronado, County of San Diego, Imperial Beach, National City, San Diego
Mission	Oceanside
Mixed Use	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, Escondido, Imperial Beach, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
Mobile Home Park	Carlsbad, Chula Vista, County of San Diego, El Cajon, Escondido, La Mesa, National City, Oceanside, Poway, San Diego, San Marcos, Vista
Multi-Family Residential	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
Multi-Family Residential Without Units	Chula Vista, County of San Diego Escondido, Imperial Beach, National City, Oceanside, San Diego
Neighborhood Shopping Center	Carlsbad, Chula Vista, County of San Diego, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Vista
Office	County of San Diego, El Cajon, Escondido, National City, San Diego, San Marcos
Office (Low-Rise)	Carlsbad, Chula Vista, County of San Diego, El Cajon, Encinitas, Escondido, La Mesa, Lemon Grove, National City, Poway, San Diego, Solana Beach, Vista
Open Space Park Or Preserve	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
Orchard Or Vineyard	County of San Diego, Escondido, Oceanside, Poway, San Diego, San Marcos
Other Group Quarters Facility	County of San Diego, El Cajon, Escondido, Oceanside, San Diego, Santee, Vista
Other Health Care	Chula Vista, County of San Diego, Escondido, San Diego, Vista
Other Public Services	Carlsbad, Chula Vista, County of San Diego, El Cajon, Escondido, Poway, San Diego, Vista
Other Recreation – High	Carlsbad, Chula Vista, Coronado, County of San Diego, El Cajon, Encinitas, Imperial Beach, National City, Oceanside, Poway, San Diego, Vista

Land Use Type	Municipality
Other Recreation – Low	County of San Diego, San Diego, Vista
Other Retail Trade And Strip	Chula Vista, Coronado, County of San Diego, El Cajon, Escondido, Imperial Beach, Lemon Grove, National City, Oceanside, Poway, San Diego, Vista
Other School	County of San Diego, Escondido, National City, Poway, San Marcos
Other Transportation	Carlsbad, Chula Vista, County of San Diego, Del Mar, Imperial Beach, Oceanside, San Diego
Other University Or College	Chula Vista, San Diego
Park – Active	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Vista
Park And Ride Lot	Chula Vista, Escondido, Oceanside
Parking Lot – Structure	San Diego
Parking Lot – Surface	Coronado, Del Mar, Escondido, National City, Oceanside, San Diego, San Marcos, Vista
Parks	Chula Vista, Coronado, National City, Oceanside, Poway, San Diego, San Marcos
Post Office	County of San Diego, El Cajon, Escondido, Oceanside, San Diego
Public Services	Carlsbad, Chula Vista, County of San Diego, San Diego
Public Storage	Chula Vista, County of San Diego, El Cajon, Escondido, Oceanside, San Diego, San Marcos, Vista
Racetrack	County of San Diego, Del Mar, San Diego
Rail Station/Transit Center	County of San Diego, Oceanside, San Diego
Railroad Right Of Way	Carlsbad, Chula Vista, County of San Diego, Del Mar, El Cajon, Encinitas, National City, Oceanside, San Diego, San Marcos, Solana Beach, Vista
Regional Shopping Center	Carlsbad, County of San Diego, Escondido, National City, Oceanside, San Diego
Religious Facility	Chula Vista, County of San Diego, Encinitas, Escondido, Oceanside, Poway, San Diego, San Marcos, Santee, Vista
Residential Recreation	Carlsbad, Chula Vista, Coronado, County of San Diego, Oceanside, San Diego, Santee, Vista
Residential Under Construction	Carlsbad, Chula Vista, County of San Diego, Encinitas, Imperial Beach, Oceanside, San Diego, Santee
Resort	Carlsbad, Coronado, County of San Diego, Oceanside, San Diego, Solana Beach
Road Right Of Way	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
School District Office	County of San Diego, Escondido, San Diego, San Marcos
Schools	Carlsbad, Chula Vista, County of San Diego, Encinitas, Escondido, National City, Poway, San Diego, San Marcos, Vista
SDSU/CSU San Marcos/UCSD	San Diego
Senior High School	County of San Diego, El Cajon, Escondido, Oceanside, San Diego
Service Station	Carlsbad, Chula Vista, Encinitas, Escondido, National City, Oceanside, San Diego, Solana Beach, Vista
Single Family Detached	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista

Land Use Type	Municipality
Single Family Multiple-Units	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
Single Family Residential	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista
Single Family Residential Without Units	Carlsbad, Coronado, County of San Diego, Del Mar, Encinitas, Escondido, Oceanside, Poway, San Diego, San Marcos, Solana Beach, Vista
Spaced Rural Residential	Carlsbad, Chula Vista, County of San Diego, Del Mar, Encinitas, Escondido, Oceanside, Poway, San Diego, San Marcos, Santee, Vista
Spaced Rural Residential Without Units	County of San Diego
Specialty Commercial	Coronado, Del Mar, San Diego
Stadium/Arena	San Diego
Tourist Attraction	San Diego
UCSD/VA Hospital/Balboa Hospital	San Diego
Undevelopable Natural Area	Coronado, County of San Diego, Oceanside, San Diego
Vacant And Undeveloped Land	Carlsbad, Chula Vista, Coronado, County of San Diego, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, S.D. County, San Diego, San Marcos, Santee, Solana Beach, Vista
Warehousing	Chula Vista, County of San Diego, Lemon Grove, National City, Oceanside, Poway, San Diego
Water	Coronado, County of San Diego, Encinitas, Imperial Beach, Oceanside, San Diego
Wholesale Trade	County of San Diego, Chula Vista, Poway

Source: FEMA 2019.

Transportation Network Improvements and Programs

Project footprints that lie in low elevations directly adjacent to the coast would be susceptible to tsunami, including coastal areas within the City of San Diego; however, the risk of tsunamis in the San Diego region is low. There is no historical precedence for large damaging seiches in the San Diego region; therefore the risk of seiches and associated risk of pollutant release affecting transportation network improvements would be low. Although the risk of tsunami and seiche is low in the San Diego region, future transportation facilities would undergo a project-specific analysis in which required standards would be applied to minimize risks from seiche or tsunami. Projects would be designed to convey 100-year flood waters, which would also sufficiently convey seiche or tsunami flows within these design parameters. In compliance with the Seismic Safety Element the risk of hazard resulting from future seismic and related events would be reduced. Project designs and review approvals would include reference to the Seismic Safety Element, CADC maps showing tsunami inundation areas, FEMA maps, and other pertinent resources to determine at-risk areas such that proposed projects are safely designed in coastal areas.

Transportation network improvements within 100-year flood hazard areas, including Managed Lanes and Technology Connectors, would be exposed to flood hazards without the appropriate design measures. Table

4.10-12 shows the transportation network improvements planned for 2050 that would encroach upon the 100-year floodplain. Design practices employed in accordance with the local HMP; Caltrans standards; and other related regulations and programs, including FHWA, FTA, and Caltrans policies on adapting to climate change, sea-level rise, and flooding, would be required. By incorporating the required design standards and complying with all applicable regulations and ordinances outlined above and in Section 4.10.2, impacts associated with release of pollutants due to inundation of a flood hazard, tsunami, or seiche zone would be minimized. Through the various requirements to incorporate floodplain management, safety ordinances, and treatment BMPs, runoff would be controlled, flooding hazards would be substantially reduced, and the risks associated with tsunami and seiche hazards would be minimized. Therefore, the transportation network improvements would not substantially increase the risk of pollutant release due to inundation of a flood hazard, tsunami, or seiche zone. This impact is less than significant.

Table 4.10-12
2050 Transportation Network Improvements in the 100-year Floodplain

Improvement Type	Improvement
Complete Corridor: ML	SR 125 (SR 905 to SR 54)
Complete Corridor: ML	SR 52 (I-5 to I-805)
Complete Corridor: ML	SR 54 (Valley Road to SR 125)
Complete Corridor: ML	SR 56 (I-5 to I-15)
Complete Corridor: ML/Goods Movement	I-15 (SR 76 to County Line)
Complete Corridor: ML/Goods Movement	I-15 (Valley Parkway to SR 76)
Complete Corridor: ML/Goods Movement	I-5 (Cassidy Street to Harbor Drive)
Complete Corridor: ML/Goods Movement	I-5 (La Costa to Cassidy Street)
Complete Corridor: ML/Goods Movement	I-5 (SR 56 to Via de La Valle)
Complete Corridor: ML/Goods Movement	I-5 (Via de La Valle to La Costa)
Complete Corridor: ML/Goods Movement	I-805 (Palm Avenue to H Street)
Complete Corridor: ML/Goods Movement	I-805 (SR 905 to Palm Avenue)
Complete Corridor: MLC	I-805 (SR 52)
Complete Corridor: MLC	I-805 (SR 54)
Complete Corridor: MLC	SR 125 (SR 52)
Complete Corridor: Connector	I-5 (I-8)
Complete Corridor: Connector	I-5 (SR 56)
Transit Leap	Commuter Rail 582
Transit Leap	Commuter Rail 583
Transit Leap	LRT 510
Transit Leap/Goods Movement	Commuter Rail 398
Active Transportation	Clairemont – Centre City Corridor

Improvement Type	Improvement
Active Transportation	Encinitas to San Marcos Corridor – Leucadia Boulevard to El Camino Real
Active Transportation	I-15 Bikeway – Murphy Canyon Road to Affinity Court
Active Transportation	I-15 Bikeway – Poway Road interchange to Carmel Mountain Road
Active Transportation	I-805 CONNECTOR
Active Transportation	I-805 Connector – Bonita Road to Floyd Avenue
Active Transportation	San Diego River Trail – Mast Park to Lakeside baseball park
Active Transportation	San Luis Rey River Trail
Active Transportation	SR 125 Connector – Bonita Road to U.S.–Mexico Border
Active Transportation	SR 52 Bikeway – I-5 to Santo Road
Active Transportation	SR 52 Bikeway – SR 52/Mast Drive to San Diego River Trail
Active Transportation	SR 56 Bikeway – El Camino Real to Caminito Pointe

2050 Conclusion

Compliance with applicable regulatory requirements and implementation of design measures, safety ordinances, and water quality requirements described above and in Section 4.10.2 would ensure that regional growth and land use changes as well as transportation network improvements would minimize the release of pollutants due inundation of a flood hazard, tsunami, or seiche zone. Through the various requirements to incorporate floodplain management, safety ordinances, and treatment BMPs, the proposed Plan would not substantially increase the risk of pollutant release due to inundation in a flood hazard, tsunami, or seiche zone. Therefore, this impact (HWQ-3) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change impacts related to risks of pollution from inundation in a flood hazard, tsunami, or seiche zone, the proposed Plan would not exacerbate climate change risks of pollution from these hazards if development and transportation projects implementing the proposed Plan remain in compliance with applicable regulatory requirements design measures, safety ordinances, and water quality requirements.

4.11 LAND USE

This section evaluates the land use impacts of the proposed Plan.

4.11.1 EXISTING CONDITIONS

REGIONAL SETTING

Historic Land Use and Regional Growth Patterns

The San Diego region is located in the southwestern corner of the United States and is bordered by Mexico to the south, the Pacific Ocean to the west, Orange and Riverside counties to the north, and Imperial County to the east. The San Diego region encompasses over 4,260 square miles and includes 18 incorporated cities, 17 tribal governments, and unincorporated San Diego County.

Existing Land Use

There are 2,727,138 acres in the San Diego region. Approximately 825,589 acres (30 percent) are developed by various land uses including residential, commercial/office, and industrial or generally support human activities, such as agriculture, military use, recreation, and infrastructure (transportation, communication, utilities) (SANDAG 2021). Open space parks account for the largest land area, with 1,329,169 acres, or about 49 percent of the region. Vacant land (543,954 acres) accounts for another 20 percent, while the remaining approximately 1 percent of the land area is covered by water (28,427). Table 4.11-1 breaks down the entire San Diego region by land use type for 2016. The 2016 land use pattern is shown in Figure 4.11-1.

Regional Growth Pattern

The western portion of the region consists of all 18 of the region's incorporated cities and military lands. As of 2016, development in this area consisted primarily of single-family residential development interspersed with open space parks and recreation land. Most of the region's multi-family residential, commercial and office, and industrial land uses also are found in the western third of the region. The eastern portion of the region is in the jurisdiction of the unincorporated County as well as 17 tribal governments. This area is predominantly characterized by open space and parks, but also the tribal reservations, vacant land, rural residential land, agriculture, and small pockets of single-family residential. Development in the eastern two-thirds is generally rural and low-density relative to the higher density urban development of the western third. Table 4.11-2 provides details about existing population, area and transportation networks in the local jurisdictions.

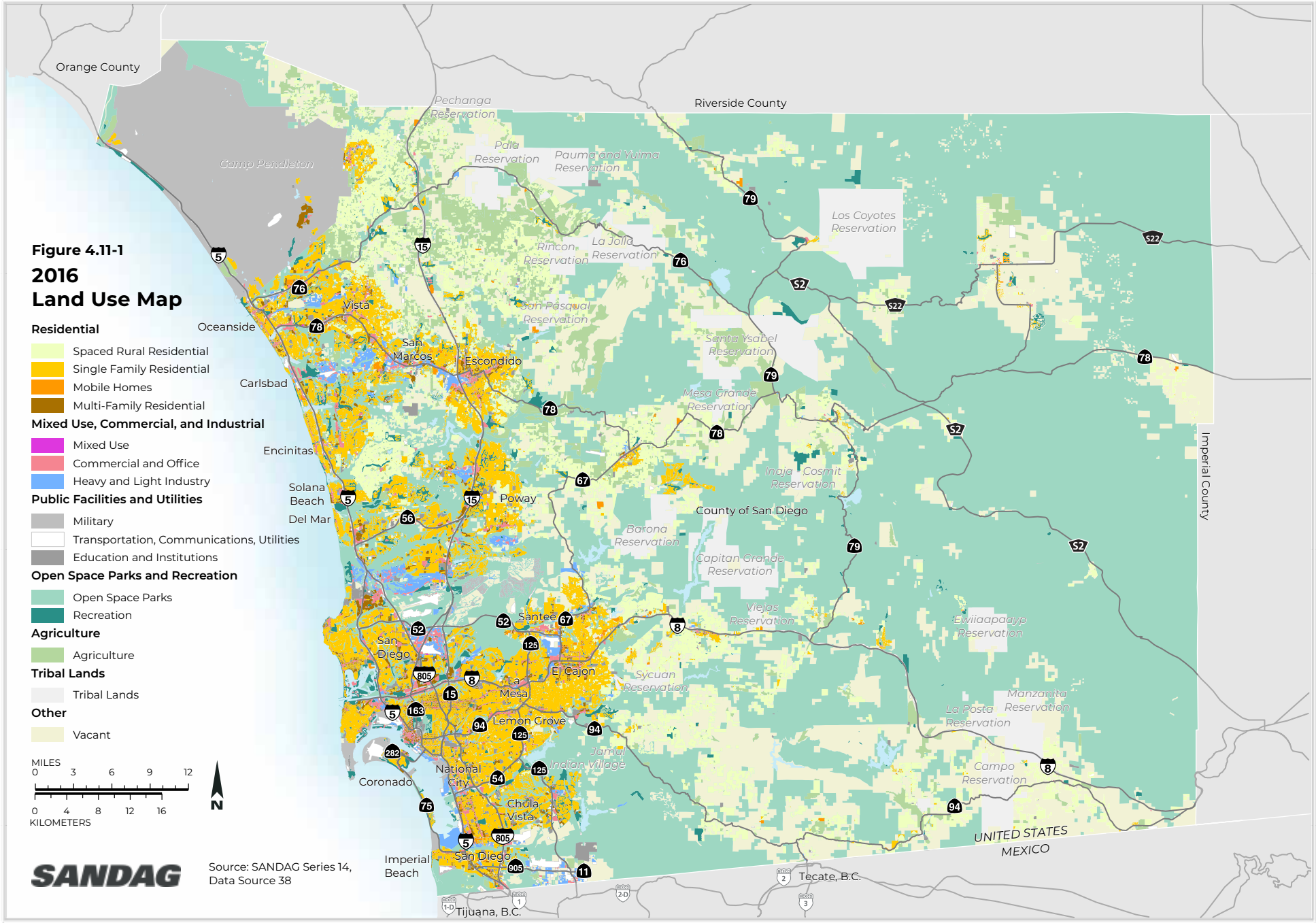


Figure 4.11-1
2016
Land Use Map
Residential
Spaced Rural Residential
Single Family Residential
Mobile Homes
Multi-Family Residential
Mixed Use, Commercial, and Industrial
Mixed Use
Commercial and Office
Heavy and Light Industry
Public Facilities and Utilities
Military
Transportation, Communications, Utilities
Education and Institutions
Open Space Parks and Recreation
Open Space Parks
Recreation
Agriculture
Agriculture
Tribal Lands
Tribal Lands
Other
Vacant
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Source: SANDAG Series 14, Data Source 38
Orange County
Riverside County
Imperial County
County of San Diego
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
La Posta Reservation
Manzanita Reservation
Jamul Indian Village
Campo Reservation
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
San Diego
Imperial Beach
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO

Table 4.11-1
Existing Land Use in the San Diego Region (2016)

Land Use Type	Acres
Agriculture	115,441
Commercial and Office	17,852
Education and Institutions	23,334
Heavy and Light Industry	18,606
Military	133,764
Mixed Use	120
Mobile Homes	6,199
Multi-Family Residential	16,721
Open Space Parks	1,329,169
Recreation	39,395
Single-Family Residential	140,620
Spaced Rural Residential	201,407
Transportation, Communications, Utilities	109,518
Under Construction	2,613
Vacant	543,954
Water	28,427
Total	**2,727,138[1]**

Source: SANDAG 2021.
[1] Total is 2 acres less than the sum of each land use listed in the table, due to the rounding of acreages for each land use type.

Table 4.11-2
Jurisdictional Information

Jurisdiction	Size (square miles)	2016 Population	Percent of Regional Population	Major Highways	Major Transit Systems
Carlsbad	39.1	113,179	3.4	I-5, SR 78	COASTER, Amtrak, NCTD Bus
Chula Vista	50.9	265,357	8.0	I-5, I-805, SR 125, SR 54	Trolley, MTS bus
Coronado	14.0	24,512	0.7	SR 75, SR 282	MTS bus
Del Mar	1.8	4,284	0.1	None	COASTER, Amtrak, NCTD bus
El Cajon	14.4	105,276	3.2	I-8, SR 125, SR 67	Trolley, MTS bus
Encinitas	19.6	62,625	1.9	I-5	COASTER, Amtrak, NCTD bus
Escondido	36.2	150,978	4.6	I-15, SR 78	SPRINTER, NCTD bus, MTS bus
Imperial Beach	4.4	28,041	0.8	SR 75	MTS bus
La Mesa	9.0	60,980	1.8	I-8, SR 125, SR 94	Trolley, MTS bus
Lemon Grove	3.9	26,710	0.8	SR 125, SR 94	Trolley, MTS bus
National City	9.2	61,350	1.9	I-5, I-805, SR 54	Trolley, MTS bus
Oceanside	42.2	176,666	5.3	I-5, SR 78, SR 76	COASTER, Amtrak, SPRINTER, NCTD bus
Poway	39.1	49,986	1.5	SR 67	MTS bus
San Diego	342.5	1,399,925	42.3	I-5, I-8, I-15, I-805, SR 15, SR 52, SR 56, SR 75, SR 94, SR 125, SR 163, SR 905	COASTER, Amtrak, Trolley, MTS bus
San Marcos	24.0	94,258	2.8	I-15, SR 78	SPRINTER, MTS bus
Santee	16.5	56,434	1.7	SR 125, SR 67, SR 52	Trolley, MTS bus
Solana Beach	3.4	13,860	0.4	I-5	COASTER, Amtrak, NCTD bus
Vista	18.6	102,933	3.1	SR 78	SPRINTER, NCTD bus
San Diego County	3,527.0	512,156	15.5	I-5, I-8, I-15, SR 54, SR 67, SR 76, SR 78, SR 79, SR 94, SR 125, SR 188	NCTD bus, MTS bus

Source: SANDAG 2021.
I- = Interstate; MTS = Metropolitan Transportation System; NCTD = North County Traffic District; SR = State Route

Other Public and Non-Jurisdictional Lands

Tribal Governments

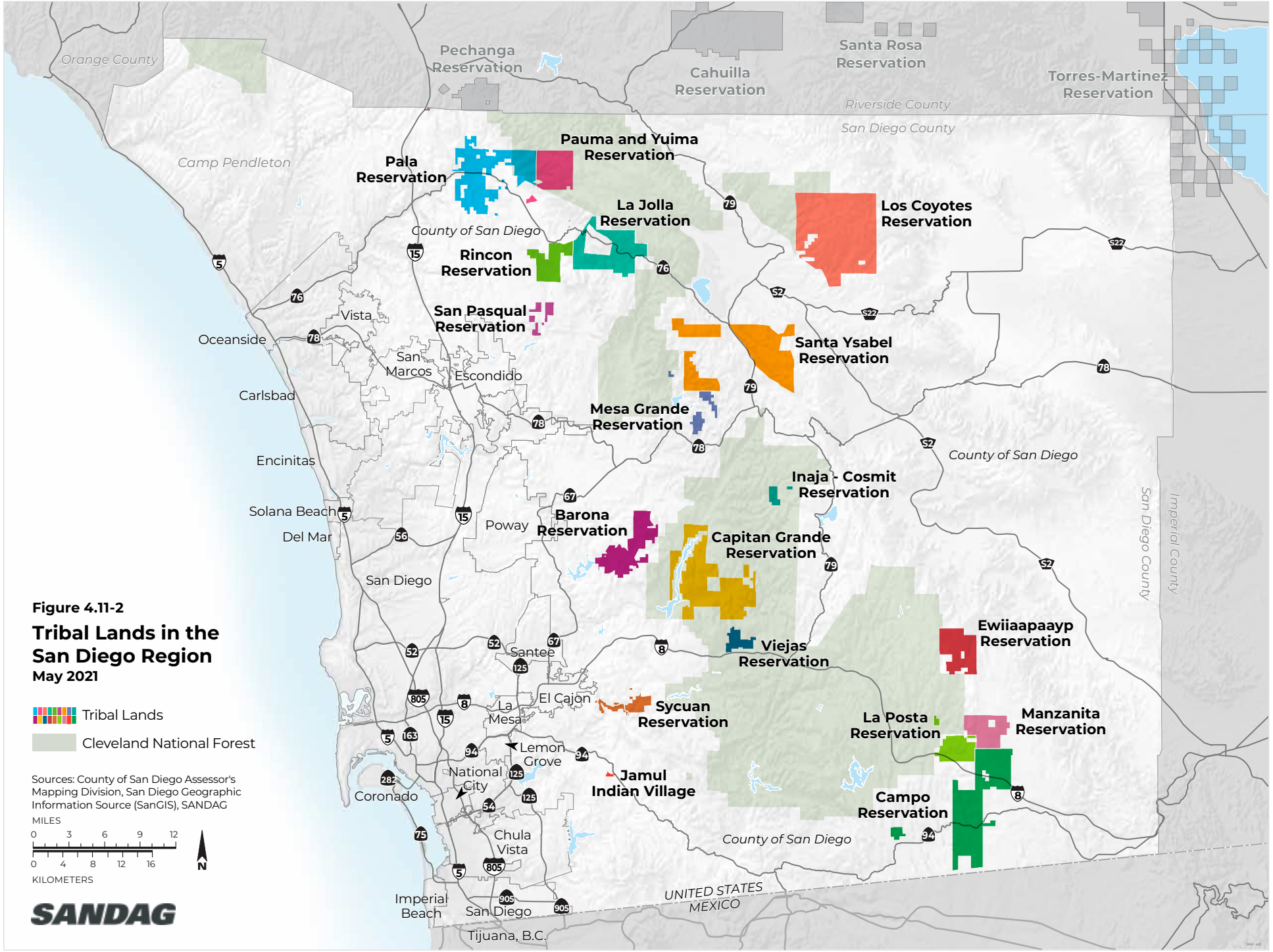
The San Diego region is home to 18 Native American reservations represented by 17 tribal governments, the most in any county in the United States, as shown in Figure 4.11-2. There are more than 73,000 acres of tribal reservation lands in the region. As sovereign domestic nations, tribal governments govern land use on their reservations and land holdings. SANDAG and the regional tribal governments work together to facilitate government-to-government planning and coordination. Table 4.11-3 details information regarding tribal nations in the San Diego region.

Table 4.11-3
Tribal Nations in the San Diego Region

Tribal Nation	Reservation Name	Population (2010 Census)	Housing Units (2010 Census)	Reservation Acreage	Location
Baron Band of Mission Indians	Barona	640	219	7,102	Barona Indian Reservation near Lakeside, about 30 miles northeast of San Diego
Campo Band of Mission Indians of the Kumeyaay Nation	Campo	362	140	15,674	Southeastern San Diego County in the Laguna Mountains
Joint Power Authority between Barona and Viejas	Capitan Grande	0	0	15,632	Northwest quadrant of the Cleveland National Forest
Ewiiaapaayp Band of Kumeyaay Indians	Ewiiaapaayp	0	0	5,549	Immediately east of Cleveland National Forest and west of Anza Borrego Desert State Park off Highway S1
Inaja Cosmit Band of Diegueno Mission Indians	Inaja and Cosmit	0	0	809	Within the boundaries of Cleveland National Forest, southwest of Julian, off Highway 78
Jamul Indian Village of Kumeyaay Nation	Jamul Indian Village	0	0	6	10 miles southeast of El Cajon, along Highway 94
La Jolla Band of Luiseño Indians	La Jolla	476	181	8,882	On Mount Palomar; off Highway 76, 25 miles east of Escondido
La Posta Band of the Kumeyaay Nation	La Posta	55	19	3,737	56 miles east of San Diego and 46 miles west of El Centro in the Laguna Mountains

Tribal Nation	Reservation Name	Population (2010 Census)	Housing Units (2010 Census)	Reservation Acreage	Location
Los Coyotes Band of Cahuilla/Cupeño Indians	Los Coyotes	98	35	24,788	50 miles east of San Diego between Cleveland National Forest and Anza-Borrego Desert State Park
Manzanita Band of Diegueño Mission Indians	Manzanita	78	35	4,551	In southeastern San Diego County off of Interstate 8, near the town of Boulevard and in the Carrizo Desert
Mesa Grande Band of Diegueño Mission Indians	Mesa Grande	98	24	1833	Near Santa Ysabel, north of Highway 78
Pala Band of Mission Indians	Pala	1,315	425	12,724	40 miles northeast of San Diego, on the San Luis Rey River
Pauma Band of Luiseño Indians	Pauma and Yuima	206	63	5,891	Northeastern corner of San Diego County, in the foothills of Mount Palomar
Rincon Band of Luiseño Indians	Rincon	1,215	357	4,034	Northeastern corner of San Diego County, along the San Luis Rey River
San Pasqual Band of Diegueño Mission Indians	San Pasqual	1,097	372	1,964	12 miles from Escondido, adjoining the community of Valley Center and on Highway S-6
Iipay Nation of Santa Ysabel	Santa Ysabel	330	140	15,368	Near Santa Ysabel and Julian along Highway 76
Sycuan Band of the Kumeyaay Nation	Sycuan	211	76	2,227	6 miles from El Cajon between Interstate 8 and State Highway 94
Viejas Band of Kumeyaay Indians	Viejas	520	192	1,687	35 miles east of San Diego, north of Interstate 8 and Alpine, 30 miles north of the U.S.-Mexico border

Source: SANDAG 2021.
Note: This table provides information on residential occupancy on the reservations and not data on tribal enrollment because tribal members can and do live on and off reservations.


Orange County
Pechanga Reservation
Cahuilla Reservation
Santa Rosa Reservation
Torres-Martinez Reservation
Riverside County
San Diego County
Camp Pendleton
Pauma and Yuima Reservation
Pala Reservation
La Jolla Reservation
Los Coyotes Reservation
County of San Diego
Rincon Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Mesa Grande Reservation
Encinitas
Inaja - Cosmit Reservation
Solana Beach
Del Mar
Poway
Barona Reservation
Capitan Grande Reservation
San Diego
Ewiiaapaayp Reservation
Viejas Reservation
Santee
El Cajon
La Mesa
Sycuan Reservation
La Posta Reservation
Manzanita Reservation
Lemon Grove
National City
Jamul Indian Village
Coronado
Campo Reservation
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
UNITED STATES
MEXICO
Imperial County
Figure 4.11-2
Tribal Lands in the San Diego Region
May 2021
Tribal Lands
Cleveland National Forest
Sources: County of San Diego Assessor's Mapping Division, San Diego Geographic Information Source (SanGIS), SANDAG
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

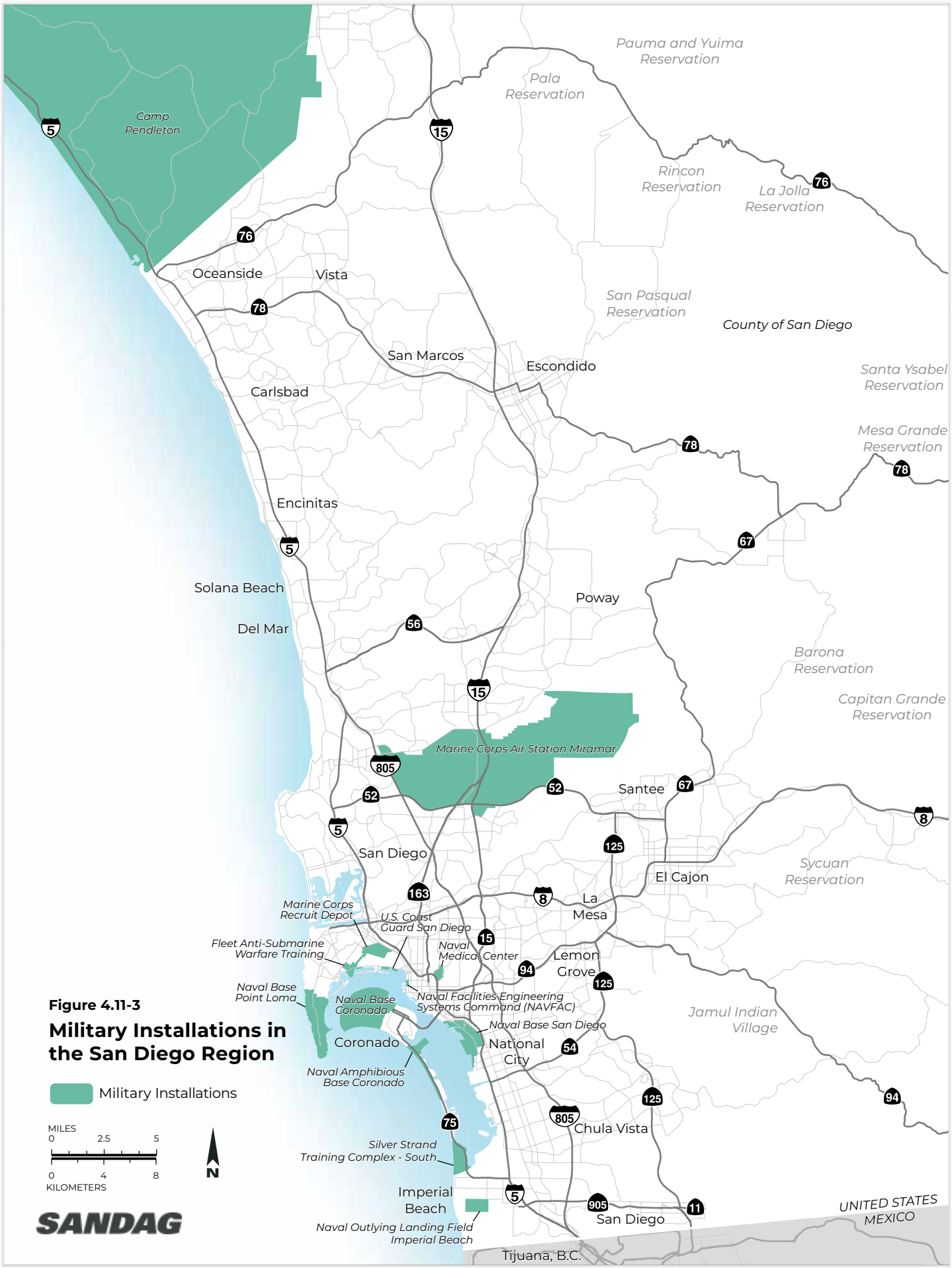
Military Installations

San Diego's location on the Pacific Ocean is ideal for many military operations in the southwest portion of the country. San Diego's military installations include a variety of sizes and uses and provide a large employment base for the region, as shown in Figure 4.11-3. Major military installations in the region are described below. Marine Corps Base (MCB) Camp Pendleton is located at the northern boundary of San Diego County near Oceanside and encompasses more than 125,000 acres. Located approximately 38 miles from downtown San Diego, MCB Camp Pendleton offers a broad spectrum of training facilities for many active and reserve Marine, Army, and Navy units, as well as national, State, and local agencies (MCB Camp Pendleton 2018). Naval Base Point Loma is located on approximately 280 acres of coastal land just west and north of downtown San Diego. Naval Base Point Loma provides support to 70 U.S. Pacific Fleet afloat and shore-based tenant commands headquartered on the base and is a highly technical hub of naval activity (My Base Guide 2019). Marine Corps Recruit Depot (MCRD) San Diego is located on 506 acres northwest of downtown San Diego, adjacent to San Diego International Airport (SDIA). MCRD San Diego provides training for marines as well as military community and family services. Marine Corps Air Station (MCAS) Miramar is located on approximately 23,000 acres in the western central portion of the region. It is home to the 3d Marine Aircraft Wing and is centrally located near more than 10 West Coast Navy and Marine Corps installations (Military.com 2019).

Naval Base Coronado (NBC) is a consolidated Navy installation encompassing eight military facilities stretching from San Clemente Island, which is located 70 miles west of San Diego, to the La Posta Mountain Warfare Training Facility, which is located 60 miles east of San Diego. Those facilities include Naval Air Station North Island; Naval Amphibious Base Coronado; Naval Outlying Landing Field Imperial Beach; Naval Auxiliary Landing Field San Clemente Island; Silver Strand Training Complex; Camp Michael Monsoor; and the Survival, Evasion, Resistance and Escape Facility in Warner Springs. Naval Air Station North Island is the anchor base of NBC (Military.com 2018).

San Diego Unified Port District

The San Diego Unified Port District (Port) was created by the California State Legislature to manage San Diego Bay and surrounding waterfront land. The Port oversees two maritime cargo terminals, two cruise ship terminals, 20 public parks, various wildlife reserves and environmental initiatives, the Harbor Police department, and the leases of more than 600 tenant and subtenant businesses around San Diego Bay. The Port has been granted authority for an approximate total of 5,483 acres or about 37 percent of the total tidelands on San Diego Bay. The shoreline frontage approaches 33 miles, which is equivalent to 61 percent of the total bay shoreline. The Port has a Port Master Plan, which is intended to provide the official planning policies, consistent with a general statewide purpose, for the physical development of the tide and submerged lands conveyed and granted in trust to the Port District (San Diego Unified Port District 2021).


Pauma and Yuima Reservation
Pala Reservation
Camp Pendleton
Rincon Reservation
La Jolla Reservation
Oceanside
Vista
San Pasqual Reservation
County of San Diego
San Marcos
Escondido
Santa Ysabel Reservation
Carlsbad
Mesa Grande Reservation
Encinitas
Solana Beach
Poway
Del Mar
Barona Reservation
Capitan Grande Reservation
Marine Corps Air Station Miramar
Santee
San Diego
El Cajon
Sycuan Reservation
Marine Corps Recruit Depot
U.S. Coast Guard San Diego
La Mesa
Fleet Anti-Submarine Warfare Training
Naval Medical Center
Lemon Grove
Naval Base Point Loma
Naval Base Coronado
Naval Facilities Engineering Systems Command (NAVFAC)
Jamul Indian Village
Naval Base San Diego
Coronado
National City
Naval Amphibious Base Coronado
Chula Vista
Silver Strand Training Complex - South
Imperial Beach
Naval Outlying Landing Field Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 4.11-3
Military Installations in the San Diego Region
Military Installations
MILES
0 2.5 5
0 4 8
KILOMETERS
N
SANDAG

Airport Authority

San Diego County Regional Airport Authority (SDCRAA) was created on January 1, 2003, as an independent agency to manage the day-to-day operations of SDIA and also serve as the region's Airport Land Use Commission (ALUC) to ensure the adoption of land use plans that protect public health and safety for areas surrounding all 16 of the San Diego region's public and private airports (SDCRAA 2018); these airports are listed in Table 4.11-4. It accomplishes this by the orderly development of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards around airports (SDCRAA 2018).

Table 4.11-4
San Diego Region's Public, ~~and~~ Private, and Military Airports

Airport	Location
Agua Caliente Springs Airport	Northeast of Agua Caliente County Park, Eastern San Diego County
Borrego Valley Airport	Borrego Springs, Eastern San Diego County
Fallbrook Community Airpark	Fallbrook, North San Diego County
Ocotillo Airport	Ocotillo Wells, Eastern San Diego County
Ramona Airport	Ramona, Northeast San Diego County
Gillespie Airport	El Cajon, East San Diego County
McClellan-Palomar Airport	City of Carlsbad, North San Diego County
MCB Camp Pendleton	North San Diego County
Jacumba Airport	Jacumba, East San Diego County
Oceanside Municipal Airport	Oceanside, North San Diego County
Brown Field Municipal	Otay Mesa, South San Diego County
Montgomery Gibbs Executive Airport	Kearney Mesa, City of San Diego
MCAS Miramar	Miramar, City of San Diego
San Diego International	Downtown San Diego, City of San Diego
NOLF Imperial Beach	Imperial Beach, San Diego County
NAS North Island	Coronado, San Diego County

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

Climate change may pose threats to land use in the San Diego region by damaging or removing habitable land and physically dividing communities (e.g., through landslides), especially along the coast. The region expects to see increases in the intensity of wildfires and heavy storms that can lead to flooding, both of which may make some areas uninhabitable (CEP and SDF 2015). Indirect impacts, such as landslides and erosion, can also reduce available buildable land (County of San Diego 2018). The San Diego region is likely to experience sea-level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix C. However, studies have not quantified the extent to which climate change would affect land use in the region.

Increased urban density, hard surfaces with inappropriate thermal properties, and lack of vegetation contribute to an urban heat island effect. Climate change is expected to have more extreme events of high temperatures, which can lead to heat exhaustion and heat stroke (EPA 2021). The San Diego region includes a large amount of open space parkland: about 49 percent of the region. Open space with permeable surfaces and tree canopy is found to mitigate the impacts of climate change by offering cooler temperatures compared to hard, impervious surfaces nearby and allowing stormwater to recharge groundwater rather than flood impervious surfaces (Motazedian and Leardini 2012, EPA 2020).

4.11.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Coastal Zone Management Act

The U.S. Congress passed the 1972 Coastal Zone Management Act (CZMA) (U.S. Code, Title 16, Section 1451 et seq.) to manage the nation's coastal resources. The CZMA is administered by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management. The CZMA balances competing land and water issues in coastal zones through the National Coastal Zone Management Program. Its goal is to preserve, protect, develop, and, where possible, restore or enhance the resources of the nation's coastal zone. Federal activities within or affecting the coastal zone must, to the maximum extent practicable, be consistent with the state's coastal management program (NOAA 2019).

Cleveland National Forest Plan

The Cleveland National Forest Plan consists of a three-part (vision, strategy, and design criteria) land and resource management plan (forest plan). The legislative mandate for the management of national forests requires that public lands be conservatively used and managed in order to ensure their sustainability and to guarantee that future generations will continue to benefit from their many values. Forest plans are founded on the concept of sustainable use of the national forests. The first part of the plan describes the national forest in the future, the niche it occupies in the community framework, and the desired conditions the Forest Service is striving to realize, as well as the challenges the national forest will resolve in getting there. The second part defines and describes each of the land use zones. The land use zones are an on-the-ground manifestation of the desired conditions and are the primary tools used to describe the strategic direction, including the management intent and suitable uses for areas of the national forest where the zone is used. The final part of the forest plan is the design criteria and constitutes the "rules" that the Forest Service will follow as the national forest implements projects and activities over time (USDA 2005). In March 2011 the Pacific Southwest Region of the Forest Service released a statement of its Leadership Intent for Ecological Restoration, which laid out the region's guiding vision and goals for its stewardship of wildland and forests for the next 15–20 years. This plan reflects the Regional leadership's current thinking on how the Leadership Intent will be implemented (USDA 2018).

Bureau of Land Management Eastern San Diego County Resource Management Plan

The Bureau of Land Management (BLM) has developed a Resource Management Plan (RMP) for the Eastern San Diego County Planning Area. The RMP covers approximately 102,869 acres of BLM administered lands. The Eastern San Diego County Planning Area spans an area of the eastern portion of Southern California's Peninsular Ranges. Most of the higher land to the west is a part of the Cleveland National Forest, while the low desert region to the east is included in the Anza–Borrego Desert State Park. Riverside County and the U.S.-

Mexico border mark the northern and southern boundaries of the Planning Area, while Imperial County borders it to the east and western San Diego County to the west (BLM 2008).

The purpose of the plan is to provide guidance in the management of the lands and resources in eastern San Diego County that will achieve the following.

1. Address conflicts between motorized, mechanized, and nonmotorized/nonmechanized recreationists.
2. Protect sensitive natural and cultural resources from impacts due to recreational use, livestock grazing, and other land uses.
3. Provide guidance for renewable energy development.
4. Provide groundwater recharge and additional recreational opportunities within the Planning Area.

The Eastern San Diego County RMP is comprehensive in nature, providing guidance for management of all uses and resources in the Eastern San Diego County Planning Area (BLM 2008).

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

Assembly Bill 1730 of 2019

Assembly Bill (AB) 1730 of 2019 requires the updated Regional Transportation Plan (RTP), Sustainable Communities Strategy (SCS), and EIR adopted by SANDAG on October 9, 2015, to remain in effect for State compliance, funding eligibility, and other purposes until December 31, 2021, when SANDAG must adopt its next update to its regional transportation plan. The bill provides that an interim update to the 2015 RTP adopted by SANDAG for purposes of compliance with certain federal laws (i.e., the 2019 Federal RTP) shall not constitute a project for the purposes of CEQA, thereby exempting it from CEQA. The bill also requires SANDAG to submit an implementation report to the California Air Resources Board (CARB) when it submits an SCS for review.

California Coastal Act

The California Coastal Act of 1976 (CCA) was enacted to "protect, maintain and where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources" (Public Resources Code Section 30001.5 et seq.). The CCA applies to the Coastal Zone, which is generally defined as extending offshore to the limits of California's jurisdiction and from the shoreline 1,000 yards upland from the mean high tide line. The CCA requires each jurisdiction within the Coastal Zone to prepare a local coastal program consisting of land use plans, zoning, and other implementing actions as needed to comply with the policies set forth in CCA Chapter 3. These affect housing and other land uses, coastal access, and public works, including all types of transportation facilities. The coastal cities and the Port District are wholly or partially within the Coastal Zone and are subject to these requirements. The adopted local coastal programs are administered by the local agencies with ultimate approval by the California Coastal Commission.

Coastal Act policies that are applicable to transportation and land use projects that would implement the Plan include, but are not limited to, the following:

Section 30212.5. Wherever appropriate and feasible, public facilities, including parking areas or facilities, shall be distributed throughout an area so as to mitigate against the impacts, social or otherwise, of overcrowding or overuse by the public of any single area.

Section 30213. Lower cost visitor and recreational facilities shall be protected, encourage, and where feasible, provided. Developments providing public recreational opportunities are preferred.

Section 30221. Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided in the area.

Section 30222. The use of private lands suitable for visitor serving commercial recreational facilities designed to enhance public opportunities for coastal recreation shall have priority over private residential, general industrial, or general commercial development, but not over agricultural or coastal-dependent industry.

Section 30222.5. Oceanfront land that is suitable for coastal dependent aquaculture shall be protected for that use, and proposals for aquaculture facilities located on those sites shall be given priority, except over other coastal dependent developments or uses.

Section 30223. Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.

Section 30255. Coastal-dependent developments shall have priority over other developments on or near the shoreline, except as provided elsewhere in this division, coastal-dependent developments shall not be sited in a wetland. When appropriate, coastal-related development should be accommodated within reasonable proximity to the coastal-dependent uses they support.

California Planning and Zoning Law

The legal framework in which California cities and counties exercise local planning and land use functions is provided in the California Planning and Zoning Law (Government Code Section 65000 et seq.) Under State planning law, each city and county is required to adopt a general plan "for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning" (Government Code Section 65300 et seq.). The California Supreme Court has called the general plan the "constitution for future development" (*Lesher Communications, Inc. v. City of Walnut Creek* [1990] 52 Cal. 3d 531). The general plan expresses the community's development goals and embodies public policy relative to the distribution of future land uses, both public and private. A general plan consists of a number of elements, including land use, circulation, housing, conservation, open space, noise, and safety; other elements may be included at the discretion of the jurisdiction that relate to the physical development of the county or city. The general plan must be comprehensive and internally consistent. Of particular importance is the consistency between the circulation and land use elements; the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, and other public utilities and facilities must be consistent with the general distribution and intensity of land used for housing, business, industry, open space, education, public areas, waste disposal facilities, agriculture, and other public and private uses.

The Office of Planning and Research (OPR) is statutorily required by Government Code Section 65040.2 to adopt and periodically revise the State General Plan Guidelines (GPG) for the preparation and content of general plans for all cities and counties in California. The 2017 version includes legislative changes, new guidance, policy recommendations, external links to resource documents, and additional resources.

A more detailed discussion of the general plans for the individual jurisdictions within the San Diego region is included in Regional and Local Laws, Regulations, Plans, and Policies below. Local jurisdictions may also adopt

specific plans, which are used to implement the general plan in particular geographic areas (Government Code Section 65450).

In addition, every local jurisdiction within the region has land use regulations that implement the general plan. The zoning ordinance is the primary land use regulation used to implement the goals and policies of its general plan. Zoning ordinances, which are required to be consistent with the general plan, provide detailed direction related to development standards; permitted, conditionally permitted, and prohibited uses; and other regulations such as parking standards and sign regulations. Zoning ordinances and land use approvals must be consistent with applicable specific plans as well as the general plan.

Cities and counties are also required to comply with the Subdivision Map Act (Government Code Section 66410 et seq.). The Subdivision Map Act sets forth the conditions for approval of a subdivision map and requires enactment of subdivision ordinances by which local governments have direct control over the types of subdivision projects to be approved and the physical improvements to be installed.

Senate Bill 375 (Chapter 728, Statutes of 2008)

Senate Bill (SB) 375 provides for a regional planning process to coordinate land use, housing, and transportation planning to help California meet State greenhouse gas (GHG) emissions reduction targets. SB 375 requires regional transportation plans developed by metropolitan planning organizations (MPOs), including SANDAG, to incorporate a Sustainable Communities Strategy (SCS) that demonstrates how the region would achieve regional GHG emissions reduction targets for light duty vehicles set by CARB. SB 375 does not require local governments to revise their "land use policies and regulations, including [their] general plan," to be consistent with the SCS (Government Code Section 65080 et seq.) The land use portion of the SCS is implemented through voluntary local government actions.

Local Agency Formation Commission Law

The Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (Government Code Section 56000 et seq.) requires that each county must have a local agency formation commission (LAFCO) responsible for creating orderly local government boundaries. The goals of the act include encouraging orderly growth and efficient public services for cities and special districts, preserving prime agricultural and open space lands, and discouraging urban sprawl. While LAFCOs have no direct authority over land use, their actions determine which government agency will be responsible for new planning areas. LAFCOs address a wide range of boundary actions, including creation of spheres of influence for cities, adjustment to boundaries of special districts, annexations, incorporations, detachments of areas from cities, and dissolution of cities.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

San Diego Forward: The Regional Plan

San Diego Forward: The Regional Plan (2015) is the predecessor to the proposed Plan. The 2015 Regional Plan presents a transportation system designed to maximize transit enhancements, integrate biking and walking elements, and promote programs to reduce transportation demand and increase efficiency (SANDAG 2015). One key theme of the 2015 Regional Plan is to improve the connections between land use and transportation plans by using smart growth principles. The 2015 Regional Plan includes an SCS that integrates regional land use, housing, and transportation planning. The 2015 Regional Plan achieves the region's State-mandated targets for per capita greenhouse gas emissions reductions from passenger vehicles. The SCS includes a land use pattern that accommodates the region's future employment and housing needs and protects sensitive

habitats and resource areas. The 2015 Regional Plan land use pattern focuses housing and jobs growth in existing urbanized areas, protects about 1.3 million acres of land, and invests in a transportation network that provides residents and workers with alternatives to driving alone. New development under the plan would be more compact and more accessible to public transit and other travel choices, such as walking and bicycling.

SANDAG's 2019 Federal RTP is an update to the regional transportation plan that complies with federal requirements. Consistent with AB 1730, the 2015 Regional Plan and its SCS are valid for State compliance, funding eligibility, and other purposes through December 31, 2021. The 2021 Regional Plan will include both federal and State requirements.

Airport Land Use Commission and Airport Land Use Compatibility Plans

The California State Aeronautics Act (Public Utilities Code Section 21670 et seq.) directs each county with an airport to establish an Airport Land Use Commission (ALUC). In each county containing a public use airport, an ALUC is required to assist local agencies in ensuring compatible land uses in the vicinity of existing or proposed airports; to coordinate planning at State, regional, and local levels; to prepare and adopt an airport land use plan as required by Public Resources Code Section 21675; to review plans or regulations submitted by local agencies; and to review and make recommendations regarding the land uses, building heights, and other issues relating to air navigation safety and promotion of air commerce. The SDCRAA is the ALUC for the San Diego region. It is responsible for the preparation of Airport Land Use Compatibility Plans (ALUCPs), which identify policies and procedures for land use and airport compatibility for areas surrounding public use and military airports. Local jurisdictions are responsible for land use compatibility controls around the airports.

San Diego Unified Port District – Port Master Plan

The Port Master Plan is the land use document governing the land and water development within the jurisdiction governed by the Port District. It was originally adopted by the Board of Port Commissioners in 1980 and was certified by the California Coastal Commission on January 21, 1981. The document serves as the governing planning document pursuant to the California Coastal Act for the land and water area within Port District jurisdiction, which extends from the western edge of Pacific Highway coincident with the historic mean high tide line to several hundred feet into San Diego Bay (Tidelands). The Port Master Plan divides the tidelands into 10 Planning Districts, or precise plans. Each Planning District is further divided into Planning Subareas, which group together tideland properties into functional units, thereby facilitating planning efforts. The document provides the official planning policies, consistent with a general statewide purpose, for the physical development of the tidelands and submerged lands conveyed and granted in trust to the Port District. The Port of San Diego is currently updating its Port Master Plan. The Revised Draft Port Master Plan was released for a 4-week public review period in November 2020, with a public workshop on December 7, 2020. The Draft EIR for the Revised Draft Port Master Plan is expected to be released for public review in mid-2021 (San Diego Unified Port District 2021).

General Plans and Land Use Regulations

Every city in the San Diego region, as well as San Diego County, has a general plan that designates appropriate land uses throughout the jurisdiction and identifies the community's land use, circulation, environmental, economic, and social goals and policies as they relate to land use and development. The general plans also provide a basis for local government decision-making, including decisions on development approvals and exactions, and they provide citizens with opportunities to participate in the planning and decision-making

processes of their communities. The County of San Diego General Plan focuses on areas not included in city general plans (i.e., unincorporated areas).

The current versions of each jurisdiction's general plan, as well as associated updates, are shown in Table 4.11-5. All of these jurisdictions have prepared or are preparing Housing Element (2021–2029) Updates with some completed and others in various stages of the drafting process.

Table 4.11-5
General Plans

Jurisdiction	General Plan	Adoption Date/Updates
Carlsbad	Carlsbad General Plan	September 2015 (Housing Element updated in April 2021)
Chula Vista	City of Chula Vista General Plan	December 2005, amended 2020 (Housing Element being updated as of April 2021)
Coronado	Coronado General Plan	November 1986, Revised November 2003 (Housing Element being updated as of July 2021)
Del Mar	The Community Plan	March 1976, amended 1985 (Housing Element updated in March 2021)
El Cajon	City of El Cajon General Plan 2000	January 2001 (Housing Element being updated as of July 2021)
Encinitas	City of Encinitas General Plan	May 1995 (Housing Element being updated as of April 2021)
Escondido	General Plan	May 2012 (Housing Element being updated as of March 2021)
Imperial Beach	City of Imperial Beach General Plan/Local Coastal Program Land Use Plan	September 2019 (Housing Element updated in June 2021)
La Mesa	2012 General Plan	July 2013 (Housing Element being updated as of June 2021)
Lemon Grove	General Plan	1996 (Housing Element being updated as of April 2021; Comprehensive General Plan update also underway as of 2021)
National City	National City General Plan	June 2011 (Housing Element being updated as of February 2021)
Oceanside	General Plan	June 2002 (Housing Element being updated as of March 2021; Comprehensive General Plan update also underway as of 2021)
Poway	Poway ~~Comprehensive~~ General Plan	November 1991 (Transportation Element updated March 2010; Housing Element ~~being~~ updated ~~as of July 2021~~August 2021; Public Safety Element being updated as of October 2021)
City of San Diego	City of San Diego General Plan	March 2008, updated 2015 (Housing Element updated in June 2020)
San Marcos	City of San Marcos General Plan	February 2012 (Housing Element updated as of July 2021; Comprehensive General Plan update also underway as of July 2021)

Jurisdiction	General Plan	Adoption Date/Updates
Santee	City of Santee General Plan	August 2003 (Housing Element being updated as of March 2021)
Solana Beach	City of Solana Beach General Plan	1988, Amended 2014 (Housing Element ~~being updated as of December 2020~~approved by City Council on April 14, 2021, submitted to the Department of Housing and Community Development for approval; revisions are underway for expected approval by the end of 2021)
Vista	Vista General Plan 2030	February 2012 (Housing Element being updated as of May 2021)
County of San Diego	San Diego County General Plan	August 2011, Amended 2020 (Housing Element being updated as of May 2021)

Sources: City of Carlsbad 2015, 2021; City of Chula Vista 2020, 2021; City of Coronado 2003, 2021; City of Del Mar 1985, 2021; City of El Cajon 2001, 2021; City of Encinitas 1995, 2021; City of Escondido 2012, 2021; City of Imperial Beach 2019, 2021; City of La Mesa 2013, 2021; City of Lemon Grove 1996, 2021a, 2021b; City of National City 2011, 2021; City of Oceanside 2002, 2021a, 2021b; City of Poway 1991, 2021; City of San Diego 2015, 2020; City of San Marcos 2012, 2021a, 2021b; City of Santee 2003, 2021; City of Solana Beach 1988, 2020; City of Vista 2014, 2021; County of San Diego 2015, 2021.

Adopted general plan land use assumptions are used as input to develop SANDAG's regional growth forecast. The forecast is based on the most recent planning assumptions, considering local general plans and other factors, as required by SB 375 (Government Code Section 65080(b)(2)(B)).

Also, every local jurisdiction within the region has land use regulations that implement their general plan, including a subdivision ordinance and zoning ordinance. Zoning ordinances, which are required to be consistent with the general plan, provide detailed direction related to development standards; permitted, conditionally permitted, and prohibited uses; and other regulations such as parking standards and sign regulations.

Local Coastal Plans

Each local jurisdictional authority (city or county) with lands within the coastal zone is required to develop, and comply with, a coastal management plan. The Coastal Act requires that any person or public agency proposing development within the Coastal Zone obtain a CDP from either the CCC or the city or county having the jurisdictional authority to issue a CDP. To comply with the Coastal Zone Management Act, localities develop Local Coastal Plans (LCPs). Table 4.11-6 shows the local jurisdictions with coastal zone jurisdiction and Figure 4.11-4 shows the respective Coastal Zone boundaries.

Table 4.11-6
Cities and County with Coastal Zone Jurisdiction

Jurisdiction
City of Oceanside
City of Carlsbad
City of Encinitas
Solana Beach
Del Mar
City of San Diego

Jurisdiction
City of Coronado
National City
North San Diego County
City of Chula Vista
City of Imperial Beach
County of San Diego

Source: California Coastal Commission 2019

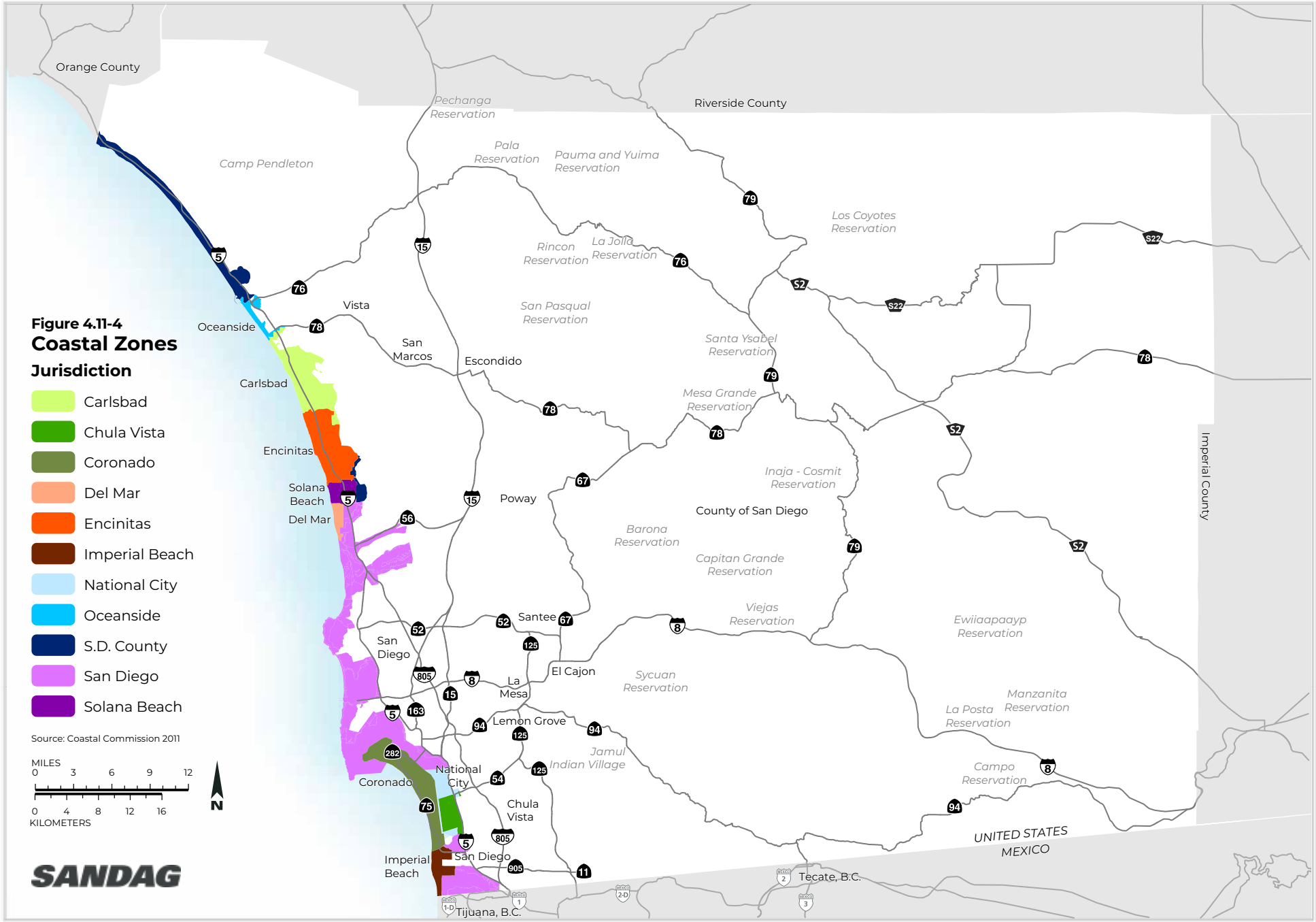


Figure 4.11-4
Coastal Zones
Jurisdiction
Carlsbad
Chula Vista
Coronado
Del Mar
Encinitas
Imperial Beach
National City
Oceanside
S.D. County
San Diego
Solana Beach
Source: Coastal Commission 2011
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Jamul Indian Village
La Posta Reservation
Manzanita Reservation
Campo Reservation
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO

Community Plans and Specific Plans

A city or county may also provide land use planning by developing community or subregional plans, including specific plans for smaller, more specific areas within its jurisdiction. These more localized plans provide for focused guidance for developing a specific area, with development standards tailored to the area, as well as systematic implementation of the general plan. Both the County of San Diego and the City of San Diego have numerous community and specific plans. A community plan is used to plan the future of a particular area to a finer level of detail than the general plan and supplements the policies of the general plan; however, these community and specific plans must be consistent with the jurisdiction's general plan. All of the jurisdictions within the San Diego region have developed and implemented numerous specific plans that delineate land uses, infrastructure, development standards and criteria, and environmental conservation measures.

To support the preparation of the analysis in Section 4.11.4, *Environmental Impacts and Mitigation Measures,* SANDAG worked closely with each jurisdiction to gather information about adopted community plans and specific plans that have yet to be implemented to assess whether the proposed Plan has any inconsistencies with these plans, per State CEQA Guidelines Section 15125(d). Each jurisdiction compiled a list of adopted plans not yet fully implemented. Information as to the type of development allowed, buildout assumptions, development completed to date, and the buildout year of each plan was provided. A comprehensive table of this community and specific plan information by jurisdiction is included in Appendix L.

4.11.3 SIGNIFICANCE CRITERIA

Appendix G of the State CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts, in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the checklist questions in Appendix G. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR and the unique characteristics of the proposed Plan.

Checklist questions for Land Use are included in Section XI (a and b) of Appendix G of the State CEQA Guidelines. Appendix G criterion XI (a) is addressed in LU-1 and criterion XI (b) is addressed in LU-2. For the purposes of this EIR, implementation of the proposed Plan would have a significant land use impact if it would:

LU-1	Physically divide an established community.
LU-2	Cause a significant environmental impact due to a conflict with any land use plan, policy or regulation (including, but not limited to, the general plan, local coastal program, or zoning ordinance) and result in a physical change to the environment not already addressed in the other resource chapters of this EIR.

4.11.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

LU-1 PHYSICALLY DIVIDE AN ESTABLISHED COMMUNITY

ANALYSIS METHODOLOGY

This analysis examines how regional growth and land use or transportation network improvements and programs under the proposed Plan could physically divide established communities. Forecasted regional growth that occurs in new developments outside of established communities would, by definition, not

physically divide established communities, and is not addressed further under Impact LU-1. For regional growth and land use change, the analysis focuses on development within established communities. The analysis focuses on whether the proposed Plan would introduce land uses that would be incompatible with existing land uses due to proposed intensities, densities, or types of use, and if that incompatibility would result in the disruption of the physical arrangement of an existing neighborhood such that a physical separation or the creation of a barrier could disrupt the physical interaction between established land uses that comprise a neighborhood or community. The potential for community disruption was assessed by evaluating the location of substantial land use density increases in relation to established communities. A review of existing land use mapping was conducted to evaluate how the proposed Plan would affect land use patterns and the consumption of currently vacant and open space lands. Regional growth and land use change are analyzed based on areas with the greatest projected land use changes in term of projected population, jobs, densities, and land uses by location. The analysis also considers impacts by area to determine: (1) the general amount and type of land that might be impacted, and (2) where impacts may be concentrated.

The analysis of transportation network improvements and programs considers whether new or expanded transportation projects or improvements under the proposed Plan would physically divide established communities. Increased frequencies on existing rail corridors and bus routes, new bus service on existing roadways, and transportation program investments (e.g. Flexible Fleets, Mobility Hubs, Next OS) under the proposed Plan would not physically divide established communities and are not addressed further under Impact LU-1. The analysis consists of a review of existing land use maps to evaluate the location of proposed major transportation network improvements and programs in relation to surrounding land uses and community development. The transportation network improvements and services considered include those that have the potential for physical impacts based on characteristics such as expansion, widening, new construction, or new configurations.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, the region is forecasted to have an increase of 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). The 2025 regional SCS land use pattern is shown in Figure 2-17. Approximately 70 percent of the forecasted regional population increase by 2025 is in the City of San Diego (56 percent), City of Chula Vista (12 percent), and City of Escondido (8.8). Similarly, these jurisdictions accommodate over 70 percent of new housing units and more than 60 percent of new jobs, by 2025. In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are Downtown, Mission Valley, Midway-Pacific Highway, and University Center. The highest proportions of forecasted job increases are in the communities of Downtown, University Center, Otay Mesa, and Kearny Mesa. In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases are Otay Mesa and North County Metro. The only significant increases in jobs over that period are in East Otay Mesa.

Physical barriers such as freeways and highways, rail lines, and large institutional land uses such as military facilities often form the boundaries of existing established communities in the region and also internally divide existing established communities. For example, the major interstate highways form large physical barriers that divide several established communities throughout the region, and large institutional facilities like military facilities and the San Diego Convention Center separate established communities from the San Diego Bay. The

established communities of the region generally feature extensive, interconnected roadway networks. In 2025, the proposed Plan forecasts a general intensification of existing land uses within established communities such as the City of San Diego and City of Chula Vista, and along key transportation corridors.

The development of new housing units and employment land uses within these existing established communities would typically occur on vacant or underutilized sites such as surface parking lots, and low-rise commercial strips, industrial buildings, and warehouses; and would also result from the conversion of low-density single-family housing properties to multi-family residences. Moreover, infill development in established communities would occur in accordance with the adopted general plans and other subregional or community plans of the cities and County of San Diego, as well as their zoning and subdivision ordinances. Adopted general plans and subregional or community plans for established communities routinely prevent developments that would physically divide established communities, and often include policies to remove existing physical barriers. For example, the community plan for Downtown San Diego includes policies to re-connect streets historically divided by large scale developments and neighborhoods physically divided by the construction of I-5. Forecasted development under the proposed Plan would create more centralized areas of residential areas and commercial centers; and would not create features that would physically divide established communities.

Construction activities associated with development routinely involve temporary disruptions within established communities such as lane or road closures and service delays or detours for bus routes. Local jurisdictions routinely require traffic control plans and related measures to ensure that construction activities accommodate vehicular, bicycle, and pedestrian access, such as designating alternate routes or scheduling disruptive activities late at night or on weekends. Construction activities would not result in the physical division of established communities.

Given the above analysis, this impact in 2025 would be less than significant.

Transportation Network Improvements and Programs

Most network improvements from 2016 to 2025 are additions to existing highways, rail corridors, or local roads located in established communities, such as the addition of managed lanes along I-5 through the coastal cities of Encinitas, Carlsbad, and Oceanside; and the addition of new toll lanes on SR 11 to the Otay Mesa East Port of Entry (POE). Other planned network improvements include active transportation projects and improvements to regional arterials, which occur along or within existing transportation alignments. Major improvements also include double-tracking at certain locations on the LOSSAN Rail Corridor and station addition in the Gaslamp Quarter in downtown San Diego. The proposed Plan also includes new infrastructure as part of the Mobility Hubs development, with the addition of parking, electric vehicle charging stations, travel kiosks, passenger loading zones, parcel delivery lockers, and carshare parking. Existing highways, rail corridors, local roads, and similar facilities physically divide existing established communities. Therefore, these and other additions or enhancements to existing facilities within established communities would not physically divide those communities where a physical division does not already exist.

Some projects in the proposed Plan could improve or expand interconnections between neighborhoods and communities that are currently separated by major transportation corridors. Examples include bridges or undercrossings (with bike lanes) of commuter rail lines, bicycle/pedestrian overcrossings of freeways, and urban trail and pathway projects. Additionally, many of the proposed projects, such as expansion of transit services, are intended to improve mobility and accessibility and may, as a result, improve community connectivity. However, larger infrastructure projects, such as rail extension or expansion projects may require

the acquisition of land in existing communities, which may divide established communities. These transportation projects would require subsequent project-level environmental review prior to their implementation. Detailed project design or specific plans could address potential divisions of existing communities. At the regional and local level, SANDAG and local jurisdictions would continue to support planning efforts for locally sponsored traffic calming and alternative transportation initiatives, such as paths, trails, overcrossings, and bicycle lanes, that foster improved neighborhoods and community connections. Nevertheless, transportation network improvement impacts related to division of an established community would be significant.

Construction of additions to existing facilities and new facilities routinely involve temporary disruptions within established communities such as land or road closures along roads and highways and service delays or detours for bus routes and passenger rail. Local jurisdictions routinely require traffic control plans and related measures to ensure that construction activities accommodate vehicular and pedestrian access, including designating alternate routes or scheduling disruptive activities late at night or on weekends. Construction activities would not result in the physical division of established communities. Therefore, construction of transportation network improvements by 2025 under the proposed Plan would not, on its own, physically divide established communities, and would have a less than significant impact.

2025 Conclusion

Implementation of transportation network improvements, but not regional growth and land use change, could physically divide established communities. Therefore, this impact in the year 2025 is significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, the region is forecasted have an increase of 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). The 2035 regional SCS land use pattern is shown in Figure 2-18. Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), City of National City (7 percent), and City of Chula Vista (2 percent). Similarly, these three jurisdictions accommodate approximately 76 percent of new housing units and 70 percent of new jobs between 2026 and 2035. In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are the Downtown, Mission Valley, Kearny Mesa, and Midway Pacific Highway. The highest proportions of forecasted job increases are in the communities of Downtown, Kearny Mesa, University Center and Otay Mesa. In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases are Lakeside, North County Metro, and Otay Mesa. The only significant increase in jobs over that period is in Otay Mesa.

The physical barriers identified in the 2025 analysis would be the same in 2035. The proposed Plan forecasts a general intensification of existing land uses within established communities such as the City of San Diego, City of National City, and City of Chula Vista and along key transportation corridors. Land use intensification is also expected to occur within Mobility Hubs, including the Central Mobility Hub and the San Ysidro Mobility Hub. The development of new housing units and employment land uses within these established communities would typically occur on vacant or underutilized sites such as surface parking lots, and low-rise commercial strips, industrial buildings, and warehouses. As described in the 2025 analysis, land use intensification would also occur with the conversion of low-density housing properties from single family uses to multi-family residences.

As discussed in the 2025 analysis, infill development in established communities would occur in accordance with the adopted general plans and other subregional and community plans of the cities and County of San Diego, as well as their zoning and subdivision ordinances. Adopted general plans and subregional and community plans for established communities routinely prevent developments that would physically divide established communities, and often include policies to remove existing physical barriers.

Construction activities associated with development routinely involve temporary disruptions within established communities such as lane or road closures and service delays or detours for bus routes. Local jurisdictions routinely require traffic control plans and related measures to ensure that construction activities accommodate vehicular, bicycle, and pedestrian access, such as designating alternate routes or scheduling disruptive activities late at night or on weekends. Construction activities would not result in the physical division of established communities. Therefore, regional growth and land use change for 2035 would not physically divide an established community. This impact is less than significant.

Transportation Network Improvements and Programs

Between 2026 and 2035, most transportation improvements would affect existing transportation facilities, such as SPRINTER rail corridor double-tracking; Blue, Orange, and Green Trolley line station enhancements; rail grade separations; additional managed lanes and conversion of general purpose lanes and shoulders to managed lanes along existing freeways and highways; improvements to regional arterials; and active transportation projects. While portions of these improvements to existing transportation facilities would likely involve temporary or permanent rights-of-way acquisition adjacent to existing facilities, the improvements to existing facilities or within existing public rights-of-way would not physically divide established communities. The planned rail grade separation along the SPRINTER corridor and Blue, Orange, and Green Trolley lines would improve connections between communities currently physically divided by rail lines.

Other planned transportation network improvements would require acquisition of new rights-of-way in highly developed established communities. This includes the development of Mobility Hubs such as the Central Mobility Hub and the San Ysidro Mobility Hub; and rail extensions such as Commuter Rail 398, from Oceanside to downtown San Diego, and Commuter Rail 582, from Sorrento Mesa to National City via UTC, Kearny Mesa, and either University Heights or City Heights. The future alignments and engineering designs for these rail extensions have not yet been determined, but are likely to be located, to the extent feasible, within existing public rights-of-way such as along existing freeways, roadways, and rail corridors in order to minimize costs associated with property acquisition and reduce impacts on owners of private property, including businesses and residents. As a result, it is expected that these extensions would generally not physically divide established communities. Planning studies for the Central Mobility Hub are currently underway, and the project would likely result in temporary and permanent ROW acquisitions.

It cannot be guaranteed that all segments of future rail extensions and Mobility Hubs would have alignments and design features that would avoid physically dividing established communities. Individual transportation network improvements, including the planned extensions of Commuter Rails 398 and 582 and the development of the Central Mobility Hub and San Ysidro Mobility Hub, would undergo separate environmental review under CEQA and NEPA, where applicable. The corresponding project-specific environmental documentation would identify significant impacts with regard to the physical division of established communities, if any, and identify mitigation measures to avoid or lessen the impact. Nevertheless, it cannot be concluded that all project-level physical division of established community impacts associated with planned commuter rail extensions would be avoided or substantially lessened. Therefore, transportation network improvements could physically divide established communities by 2035. This is a significant impact.

2035 Conclusion

Implementation of transportation network improvements, but not regional growth and land use change, could physically divide established communities. Therefore, this impact (LU-1) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, the region is forecasted to have an increase of 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent). The 2050 regional SCS land use pattern is shown in Figure 2-19. Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), City of San Marcos (13 percent), and City of Chula Vista (28 percent). Similarly, these three jurisdictions accommodate approximately 89 percent of new housing units and 72 percent of new jobs between 2036 and 2050. In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are the Downtown, Midway Pacific Highway, and Uptown. The highest proportions of forecasted job increases are in the communities of Downtown, Otay Mesa, Kearny Mesa, and University Center. In the unincorporated County, the communities with the highest proportion of forecasted population increases are Lakeside, North County Metro, and Valle de Oro. The only significant increase in jobs over that period is in East Otay Mesa.

As described in the 2025 and 2035 analyses, physical barriers such as freeways and highways, rail lines, and large institutional land uses such as military facilities often form the boundaries of existing established communities in the region, and also internally divide existing established communities. The established communities of the region generally feature extensive, interconnected roadway networks. The proposed Plan forecasts a general intensification of existing land uses within established communities such as the City of San Diego, City of San Marcos, and City of Chula Vista and along key transportation corridors. The development of new housing units and employment land uses within these established communities would typically occur on vacant or underutilized sites such as surface parking lots, and low-density residential properties, low-rise commercial strips, industrial buildings, and warehouses. Moreover, infill development in established communities would occur in accordance with the adopted general plans and other subregional and community plans of the cities and County of San Diego, as well as their zoning and subdivision ordinances. Adopted general plans and subregional and community plans for established communities routinely prevent development that would physically divide established communities, and often include policies to remove existing physical barriers.

Construction activities associated with development routinely involve temporary disruptions within established communities such as lane or road closures and service delays or detours for bus routes. Local jurisdictions routinely require traffic control plans and related measures to ensure that construction activities accommodate vehicular and pedestrian access, such as designating alternate routes or scheduling disruptive activities late at night or on weekends. Construction activities would not result in the physical division of established communities.

Based on the above analysis, regional growth and land use change would not physically divide an established community in year 2050. This impact is less than significant.

Transportation Network Improvements and Programs

Between 2036 and 2050, most transportation network improvements would affect existing transportation facilities, such as SPRINTER, Blue, Orange, and Green Trolley line station enhancements; rail grade separations; additional managed lanes and conversion of general purpose lanes and shoulders to managed lanes along existing freeways and highways; improvements to regional arterials; and active transportation projects. While portions of these improvements to existing transportation facilities would likely involve temporary or permanent right-of-way acquisition adjacent to existing facilities, the improvements to existing facilities or within existing public rights-of-way would not physically divide established communities. The planned rail grade separation along the Blue, Orange, and Green Trolley lines would improve connections between communities currently physically divided by rail lines.

Other planned transportation network improvements would require acquisition of new rights-of-way in highly developed established communities. This includes the Commuter Rail 581 extension from downtown to El Cajon and from the Central Mobility Hub to El Cajon, Commuter Rail 582 extension from National City to the U.S.-Mexico Border, Commuter Rail 583 extension from the Central Mobility Hub to the U.S.-Mexico Border via downtown San Diego, Commuter Rail 398 extension from Oceanside to downtown San Diego, and the SPRINTER extension to Westfield North County Shopping Center ~~North County Fair~~. The future alignments and engineering designs for these rail extensions have not yet been determined, but are likely to be located, to the extent feasible, within existing public rights-of-way such as along existing freeways, roadways, and rail corridors in order to minimize costs associated with property acquisition and reduce impacts on owners of private property, including businesses and residents. As a result, these extensions would generally not physically divide established communities.

However, it cannot be guaranteed that all segments of future rail extensions would have alignments and design features that would avoid physically dividing established communities. Individual transportation network improvements, including the planned Commuter Rail and SPRINTER extensions and the development of Mobility Hubs, would undergo separate environmental review under CEQA and NEPA, where applicable. The corresponding project-specific environmental documentation would identify significant impacts with regard to the physical division of established communities, if any, and identify mitigation measures to avoid or lessen the impacts. Nevertheless, it cannot be concluded that all project-level physical division of established communities associated with planned rail extensions and Mobility Hubs would be avoided or substantially lessened. Therefore, transportation network improvements could physically divide established communities in year 2050. This is a significant impact.

2050 Conclusion

Implementation of transportation network improvements, but not regional growth and land use change, could physically divide established communities. Therefore, this impact in the year 2050 is significant.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan may divide communities through transportation network improvements as described above. This would exacerbate the potential climate change effects on established communities, as climate change may divide communities by damaging or removing habitable land (e.g., wildfires, flooding), or even physically separating communities (e.g., landslides), as described in Section 4.11.1, *Existing Conditions*.

MITIGATION MEASURES

LU-1 PHYSICALLY DIVIDE AN ESTABLISHED COMMUNITY

2025, 2035, and 2050

LU-1 Provide Access and Connections for Transportation Network Improvements. During planning, design, and project-level CEQA review of transportation network improvements, including new rail extensions, Mobility Hubs, and roadway widening improvements, SANDAG shall, and other transportation project sponsors can and should, design new transportation network improvements within established communities to avoid the creation of barriers that physically divide such communities. Where avoidance is not feasible, measures to reduce the creation of barriers that physically divide such communities should be considered, including but not limited to, the following:

- Selecting alignments within or adjacent to existing public rights-of-way.
- Designing sections above- or below-grade to avoid or reduce physical division of communities, where feasible.
- Providing direct crossings, overcrossings, or undercrossings at regular intervals for various modes of travel (e.g., pedestrians/bicyclists, vehicles).

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of mitigation measure LU-1 would reduce impacts regarding the physical division of established communities associated with transportation network improvements through implementation of feasible alignments, design options, and other design features that avoid or substantially reduce impacts on community division. However, there is no guarantee that the impact would be reduced to less-than-significant levels for all projects. Therefore, the physical division of established communities resulting from transportation network improvements would remain significant and unavoidable.

LU-2 CAUSE A SIGNIFICANT ENVIRONMENTAL IMPACT DUE TO A CONFLICT WITH ANY LAND USE PLAN, POLICY, OR REGULATION (INCLUDING, BUT NOT LIMITED TO, THE GENERAL PLAN, LOCAL COASTAL PROGRAM, OR ZONING ORDINANCE) AND RESULT IN A PHYSICAL CHANGE TO THE ENVIRONMENT NOT ALREADY ADDRESSED IN THE OTHER RESOURCE CHAPTERS OF THIS EIR.

ANALYSIS METHODOLOGY

The land use and planning analysis describes existing land use/zoning and regional and local land use plans, policies, or regulations, and is intended to help fulfill the requirements of CEQA Guidelines Section 15125(d). The analysis also describes changes in the land use due to the forecasted regional growth and land use change and planned transportation network improvements. The emphasis of the analysis is on plan consistency and potential conflicts between the proposed Plan and existing land use plans, policies, and regulations adopted to avoid or mitigate environmental effects. The proposed Plan is considered consistent with the provisions of the identified regional and local plans if it meets the general intent of the applicable land use plans. A given project need not be in perfect conformity with each and every policy nor does State law require precise conformity of

a proposed project with every policy or land use designation for a site. Courts have recognized that general and specific plans attempt to balance a range of competing interests. It follows that it is nearly, if not absolutely, impossible for a project to be in perfect conformity with each and every policy set forth in the applicable plan. If the proposed Plan is determined to be inconsistent with specific individual objectives or policies of an applicable plan, but is largely consistent with the land use or the other goals and policies of that plan and would not preclude the attainment of the primary intent of the land use plan, the proposed Plan would not be considered inconsistent with the plan. Furthermore, in this impact analysis, any such inconsistency would also have to result in a new physical change in the environment, not analyzed in the other resource chapters of this EIR, to result in a significant environmental impact. The discussion below provides a brief overview of the most relevant policies and development standards from the various planning documents. However, the proposed Plan's consistency conclusions are based upon the planning documents as a whole.

Where there are conflicts, the analysis examines the effects of those conflicts on the physical environment. Conflicts with land use portions of adopted general plans, local coastal programs, the Port Master Plan, or other applicable subregional plans, such as specific plans and community plans, are generally analyzed in this section. Any such plan-level conflicts could also cause conflicts with land use policies or regulations that implement the plans. Conflicts with resource-specific plans, policies, or regulations are analyzed in the respective EIR resource sections. For example, consistency with airport land use compatibility plans is addressed in Sections 4.9, *Hazards and Hazardous Materials,* and 4.13, *Noise and Vibration*, and consistency with habitat conservation plans is addressed in Section 4.4, *Biological Resources***.**

For regional growth and land use change, the impact analysis uses SANDAG's forecasted growth rates as described in Chapter 2, *Project Description*, to analyze forecasted development based on the SCS land use pattern throughout the region as projected under the proposed Plan, including new growth in existing urbanized areas. Land use plans, policies, and regulations by jurisdiction are considered generally and describe how the proposed Plan may shape future development patterns that, as a consequence of the proposed Plan's implementation, might cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation that was established to avoid or mitigate an environmental effect. Regional growth and land use change and planned transportation network improvements would generally be consistent with the planning strategies outlined by the Cleveland National Forest Plan and the Eastern San Diego County Resource Management Plan. Because regional growth and land use change and expansion of the transportation network within federal lands are generally restricted, conflicts with these existing plans would be avoided and, therefore, are not evaluated further.

The analysis of transportation network improvements focuses on the proposed Plan's new infrastructure or facilities that may conflict with adopted local land use plans, policies, or regulations. Improvements and programs involving only operational changes such as those that would occur under the Next OS program would not substantially affect local land use plans, policies, or regulations, and therefore are not evaluated further. Spatial analysis is used to evaluate location of large-scale transportation projects and their consistency with local land use plans, policies, or regulations.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

The forecasted development of the proposed Plan is based on the Series 14 Regional Growth Forecast SCS land use pattern, which is, in turn, based on the adopted general plans of the cities and County of San Diego and on the most recent planning assumptions, considering local general plans and other factors, as required by SB 375 (Government Code Section 65080(b)(2)(B)). Local coastal programs are components of local general plans. In a few cases, the SCS land use pattern may conflict with specific land use designations in general plans, but impacts of SCS implementation are already evaluated in other sections of this EIR so these conflicts would not cause new significant impacts. Regional Growth Forecast is described in detail in Appendix F of the proposed Plan.

SANDAG's 6th Cycle RHNA Plan is integrated into the proposed Plan's SCS and may temporarily be inconsistent with existing (5th Cycle, 2013-2020) Housing Elements. As required by State law, some jurisdictions' 6th Cycle (2021-2029) Housing Element updates have been completed while others are currently in progress; there would be no significant environmental impact not evaluated in other EIR sections caused by the temporary inconsistency.

Subregional plans, such as community or specific plans, are required to be consistent with adopted general plans. Because the proposed Plan is based on adopted general plans, the proposed Plan would not conflict subregional plans. Subregional plans identified by local jurisdictions that have been adopted but not yet fully built-out are identified in Appendix L to this EIR. In a few cases, the SCS land use pattern may conflict with specific land use designations in subregional plans, but impacts of SCS implementation are already evaluated in other sections of this EIR so these conflicts would not cause new significant impacts.

From 2016 to 2025, the region is forecasted to have an increase of 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). The 2025 regional SCS land use pattern is shown in Figure 2-17. Approximately 70 percent of the forecasted regional population increase between 2016 and 2025 is in the City of San Diego (56 percent) and City of Chula Vista (12 percent). Similarly, these two jurisdictions accommodate over 70 percent of new housing units and more than 60 percent of new jobs by 2025.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are the Downtown, Mission Valley, Midway-Pacific Highway, and University Center. The highest proportions of forecasted job increases are in the communities of Downtown, University Center, Otay Mesa, and Kearny Mesa. In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases are Otay Mesa and North County Metro. The only significant increase in jobs over this period is in East Otay Mesa.

Development patterns would focus more residential, commercial, and office uses in existing urban areas; growth in the unincorporated areas would be focused within existing rural communities. These development patterns, which would be served by transit capital projects, improvements in transit service, and active transportation projects, are consistent with local land use plans, policies, and subregional plans in urban areas calling for higher density development served by high quality transit and bicycle and pedestrian improvements. For instance, development patterns in the communities with the highest forecasted growth such as the City of San Diego would be consistent with the City's General Plan and recently approved community plan updates

that implement more sustainable land use and transportation connections. The proposed Plan's focus on development in the urbanized western portions of the San Diego region is also consistent with the planning goals of smaller rural communities in the eastern portion of the region to maintain a more rural, non-urbanized character.

Therefore, regional growth and land use change between 2016 and 2025 would generally not conflict with land use plans, policies, and regulations, including general plans, specific plans, and community plans, adopted for the purpose of avoiding or mitigating an environmental effect. In a few cases, the SCS land use pattern may conflict with specific land use designations in general plans or subregional plans, but impacts of SCS implementation are already evaluated in other sections of this EIR so these conflicts would not cause new significant impacts. This impact is less than significant.

Transportation Network Improvements and Programs

The transportation network improvements for 2025 include active transportation projects, improvements to regional arterials, and additions to existing highways, rail corridors, or local roads, such as the addition of managed lanes along I-5 through the coastal cities of Encinitas, Carlsbad, and Oceanside; the addition of a freeway connector between southbound SR 125 and eastbound SR 94; and improvements to the Otay Mesa POE southbound truck route. While portions of these improvements to existing transportation facilities and the active transportation projects would likely involve temporary and permanent right-of-way acquisition adjacent to existing facilities or rights-of-way, the improvements to existing facilities or within existing public rights-of-way would not conflict with the land use policies and regulations of general plans or other applicable land use plans, including specific plans and community plans, adopted for the purposes of avoiding or mitigating an environmental effect. Improvements to regional arterials are projects identified in adopted circulation elements, which are required by law to be consistent with adopted land use plans.

Subregional plans identified by local jurisdictions that have been adopted but not yet built out are identified in Appendix L to this EIR. For example, San Marcos has drafted specific plans for the San Marcos Creek and University districts, adding mixed-use development near California State University, San Marcos, and the SPRINTER rail corridor. The City of Santee includes the Fanita Ranch Specific Plan with proposed mixed-use residential and commercial developments and preservation of open space and agricultural lands. The City of San Diego includes mixed-use residential and commercial development in the coastal areas such as Pacific Beach and Clairemont and along the San Diego River in the Mission Valley area. Eastern Chula Vista also includes specific plans for new planned communities in Otay Ranch (Villages 13 and 14), near the planned South Bay Rapid Transit. In the unincorporated portion of San Diego, the Warner Springs Ranch Specific Plan includes mixed-use residential, commercial, and passive recreational uses. Major development projects planned by the Port of San Diego include the Chula Vista Bayfront and the future Convention Center expansion. The planned improvements along the major transportation corridors would not conflict with the development of these projects. Individual transportation network improvements would undergo separate environmental review under CEQA and NEPA, where applicable. The corresponding project-specific environmental documentation would identify significant impacts with regard to conflicts with land use policies of adopted plans, if any, and identify mitigation measures to avoid or lessen significant physical impacts on the environment resulting from any conflicts.

Nevertheless, it cannot be concluded that all project-level conflicts would be avoided or substantially lessened. Therefore, transportation network improvements in year 2025 would conflict with land use plans, policies, and regulations, including general plans, specific plans, and community plans, adopted for the purpose of avoiding or mitigating an environmental effect. However, impacts of transportation network improvements are already

evaluated in other sections of this EIR, so these conflicts would not cause new significant impacts. Therefore, this impact is less than significant.

2025 Conclusion

While implementation of regional growth and land use change and transportation network improvements, would conflict with land use plans, policies, and regulations, including general plans, specific plans, and community plans, adopted for the purpose of avoiding or mitigating an environmental effect, impacts are already evaluated in other sections of this EIR, so these conflicts would not cause new significant impacts Therefore, this impact (LU-2) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, the region is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). The 2035 regional SCS land use pattern is shown in Figure 2-18. Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), City of National City (7 percent), and City of Chula Vista (2 percent). Similarly, these three jurisdictions accommodate approximately 76 percent of new housing units and 70 percent of new jobs between 2026 and 2035.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are the Downtown, Mission Valley, Kearny Mesa, and Midway Pacific Highway. The highest proportions of forecasted job increases are in the communities of Downtown, Kearny Mesa, University and Otay Mesa. In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases are Lakeside, North County Metro and Otay Mesa. The only significant increase in jobs over that period is in East Otay Mesa.

Development patterns would focus more residential, commercial, and office uses in existing urban areas; growth in the unincorporated areas would be focused within existing rural communities. These development patterns, which would be served by transit capital projects, improvements in transit service, and active transportation projects, are generally consistent with local land use plans, policies, and subregional plans in urban areas calling for higher density development served by high quality transit and bicycle and pedestrian improvements. The proposed Plan's focus on development in the urbanized western portions of the San Diego region is also consistent with the planning goals of smaller rural communities in the eastern portion of the region to maintain a more rural, nonurbanized character. In a few cases, the SCS land use pattern may conflict with specific land use designations in subregional plans, but impacts of SCS implementation are already evaluated in other sections of this EIR so these conflicts would not cause new significant impacts.

Therefore, regional growth and land use change between 2026 and 2035 would not conflict with land use plans, policies, and regulations, including general plans, specific plans, and community plans, adopted for the purpose of avoiding or mitigating an environmental effect. This impact is less than significant.

Transportation Network Improvements and Programs

Between 2026 and 2035, most transportation improvements would affect existing transportation facilities, such as SPRINTER rail corridor double-tracking; Blue, Orange, and Green Trolley line station enhancements; rail grade separations; additional managed lanes and conversion of general purpose lanes to managed lanes

along existing freeways and highways; improvements to regional arterials; and active transportation projects. While portions of these improvements to existing transportation facilities would likely involve temporary or permanent right-of-way acquisition adjacent to existing facilities, the improvements to existing facilities or within existing public rights-of-way would not conflict with the land use portions of adopted general plans or other applicable land use plans, including specific plans and community plans, adopted for the purpose of avoiding or mitigating an environmental effect. Improvements to regional arterials are projects identified in adopted Circulation Elements, which are required by law to be consistent with adopted land use plans.

Subregional plans identified by local jurisdictions that have been adopted but not yet built out are identified in Appendix L to this EIR. As described in the 2025 analysis, the developments include mixed-used residential and commercial uses in the cities of San Marcos, Santee, and San Diego and in unincorporated lands such as Warner Springs and Eastern Chula Vista. Various infill developments are also planned for buildout completion by 2035 in the cities of Carlsbad and El Cajon. The planned improvements along the major transportation corridors would not conflict with the development of these projects and impacts, were determined to be less than significant.

The planned transportation network improvements for 2035 are described above. These improvements include the proposed rail extensions which would be located, to the extent feasible, within existing public rights-of-way such as along existing freeways, roadways, and rail corridors in order to minimize costs associated with property acquisition and reduce impacts on owners of private property, including businesses and residents. As a result, these rail extensions would not generally conflict with land use portions of adopted plans.

However, it cannot be guaranteed that all planned rail extensions would have alignments and design features that would avoid land use conflicts with adopted plans. Individual transportation network improvements, including projects such as the Del Mar Tunnel, the inland rail relocation from the Del Mar bluffs, bluffs restoration, and the planned seasonal platform at the Del Mar Fairgrounds, would undergo separate environmental review under CEQA and NEPA, where applicable. The corresponding project-specific environmental documentation would identify significant impacts with regard to conflicts with land use portions of adopted plans, if any, and identify mitigation measures to avoid or lessen significant physical impacts on the environment resulting from any conflicts.

Nevertheless, it cannot be concluded that all project-level conflicts would be avoided or substantially lessened. Therefore, transportation network improvements in year 2035 would conflict with land use plans, policies, and regulations, including general plans, specific plans, and community plans, adopted for the purpose of avoiding or mitigating an environmental effect. However, impacts of transportation network improvements are already evaluated in other sections of this EIR, so these conflicts would not cause new significant impacts. Therefore, this impact is less than significant.

2035 Conclusion

While implementation of regional growth and land use change and transportation network improvements would conflict with land use plans, policies, and regulations, including general plans, specific plans, and community plans, adopted for the purpose of avoiding or mitigating an environmental effect, impacts are already evaluated in other sections of this EIR, so these conflicts would not cause new significant impacts Therefore, this impact (LU-2) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, the region is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent). The 2050 regional SCS land use pattern is shown in Figure 2-19. Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), City of San Marcos (13 percent), and City of Chula Vista (28 percent). Similarly, these three jurisdictions accommodate approximately 89 percent of new housing units and 72 percent of new jobs between 2036 and 2050.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are the Downtown, Midway Pacific Highway, and Uptown. The highest proportions of forecasted job increases are in the communities of Downtown, Otay Mesa, Kearny Mesa, and University Center. In the unincorporated County, the communities with the highest proportion of the forecasted population increases are Lakeside, North County Metro, and Valle de Oro. The only significant increase in jobs over that period is in Otay Mesa.

Development patterns would focus more residential, commercial, and office uses in existing urban areas; growth in the unincorporated areas would be focused within existing rural communities. These development patterns, which would be served by transit capital projects, improvements in transit service, and active transportation projects, are generally consistent with local land use plans, policies, and subregional plans in urban areas calling for higher density development served by high quality transit and bicycle and pedestrian improvements. The proposed Plan's focus on development in the urbanized western portions of the San Diego region is also consistent with the planning goals of smaller rural communities in the eastern portion of the region to maintain a more rural, nonurbanized character. In a few cases, the SCS land use pattern may conflict with specific land use designations in subregional plans, but impacts of SCS implementation are already evaluated in other sections of this EIR so these conflicts would not cause new significant impacts.

Therefore, regional growth and land use change between 2036 and 2050 would not conflict with land use plans, policies, and regulations, including general plans, specific plans, and community plans, adopted for the purpose of avoiding or mitigating an environmental effect. This impact is less than significant.

Transportation Network Improvements and Programs

In 2050, most transportation network improvements would affect existing transportation facilities, such as Blue, Orange, and Green Trolley line station enhancements; rail grade separations; additional managed lanes and conversion of general purpose lanes to managed lanes along existing freeways and highways; improvements to regional arterials; and active transportation projects. While portions of these improvements to existing transportation facilities would likely involve temporary or permanent right-of-way acquisition adjacent to existing facilities, the improvements to existing facilities or within existing public rights-of-way would not conflict with the land use portions of adopted general plans or other applicable land use plans, including specific plans and community plans, adopted for the purpose of avoiding or mitigating an environmental effect.

Subregional plans identified by local jurisdictions that have been adopted but not yet built out are identified in Appendix L to this EIR. As described in the 2025 analysis, the developments include mixed-used residential and commercial uses in the cities of San Marcos, Santee, and San Diego and in unincorporated lands such as Warner

Springs and Eastern Chula Vista. Various infill developments are also planned for buildout completion by 2050 in the City of Encinitas. The planned improvements along the major transportation corridors would not conflict with the development of these projects.

Other planned transportation network improvements would require acquisition of new rights-of-way in highly developed areas along transportation corridors. This includes the Commuter Rail 581 extension from downtown to El Cajon and from the Central Mobility Hub to El Cajon, Commuter Rail 582 extension from National City to the U.S.-Mexico Border, Commuter Rail 583 extension from the Central Mobility Hub to the U.S.-Mexico Border via Downtown San Diego, Commuter Rail 398 extension from Oceanside to downtown San Diego, and the SPRINTER extension to Westfield North County Shopping Center ~~North County Fair~~. The future alignments and engineering designs for these rail extensions have not yet been determined, but are likely to be located, to the extent feasible, within existing public rights-of-way such as along existing freeways, roadways, and rail corridors in order to minimize costs associated with property acquisition and reduce impacts on owners of private property, including businesses and residents. As a result, it is likely that these extensions would generally not conflict with land use portions of adopted plans.

However, it cannot be guaranteed that all planned rail extensions would have alignments and design features that would avoid land use conflicts with adopted plans. Individual transportation network improvements would undergo separate environmental review under CEQA and NEPA, where applicable. The corresponding project-specific environmental documentation would identify significant impacts with regard to conflicts with land use portions of adopted plans, if any, and identify mitigation measures to avoid or lessen significant physical impacts on the environment resulting from any conflicts.

Nevertheless, it cannot be concluded that all project-level conflicts would be avoided or substantially lessened. Therefore, transportation network improvements would conflict with land use plans, policies, and regulations, including general plans, specific plans, and community plans, adopted for the purpose of avoiding or mitigating an environmental effect. However, impacts of transportation network improvements are already evaluated in other sections of this EIR, so these conflicts would not cause new significant impacts. Therefore, this impact is less than significant.

2050 Conclusion

While implementation of regional growth and land use change and transportation network improvements would conflict with land use plans, policies, and regulations, including general plans, specific plans, and community plans, adopted for the purpose of avoiding or mitigating an environmental effect, impacts are already evaluated in other sections of this EIR, so these conflicts would not cause new significant impacts Therefore, this impact (LU-2) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

Climate change impacts are anticipated regardless of regional growth and land use change or planned transportation network improvements. Future land use plans, policies, or regulations may be revised to incorporate climate change conditions; however, implementation of the proposed Plan is not expected to exacerbate these climate change effects with respect to conflicts with existing land use plans, policies, or regulations.

4.12 MINERAL RESOURCES

This section evaluates the mineral resources impacts of the proposed Plan. Some of the information in this section is summarized from the data included in Appendix M of this EIR.

4.12.1 EXISTING CONDITIONS

SAN DIEGO REGION MINERAL RESOURCES

Mineral resources in the San Diego region serve various public, commercial, scientific, and recreational purposes. The term "mineral resources" refers to a concentration of naturally occurring minerals in a form and amount that makes economic extraction potentially feasible (SMGB 2018). Locally important mineral resources in the San Diego region include construction aggregate materials (sand, gravel, and crushed rock), industrial and chemical mineral materials (limestone, dolomite, and marble), and metallic and rare materials (precious metals, gemstones, iron and other ferro-alloy metals, copper, lead, zinc, and optical-grade calcite) (County of San Diego 2011). These finite resources are each important to the region's economy, but due to their importance in construction of vital infrastructure, aggregate materials are the most economically important mineral category. Other mineral resources in the San Diego region include the Pala Gem Mining District on land governed by the Pala Band of Mission Indians (BIA 1982), granite and marble dimension stone used for buildings and countertops, and a variety of industrial and chemical minerals such as ash, boron and clay.

The location of mineral resources is related to the geologic environments in which certain mineral deposits were formed. In the San Diego region, deposits formed during the Quaternary, Tertiary, and Cretaceous Ages can be the source of mineral resources (County of San Diego 2011). For example, Quaternary alluvium is a source of sand and gravel that can be mined and processed to produce construction aggregate (City of San Diego 2011).

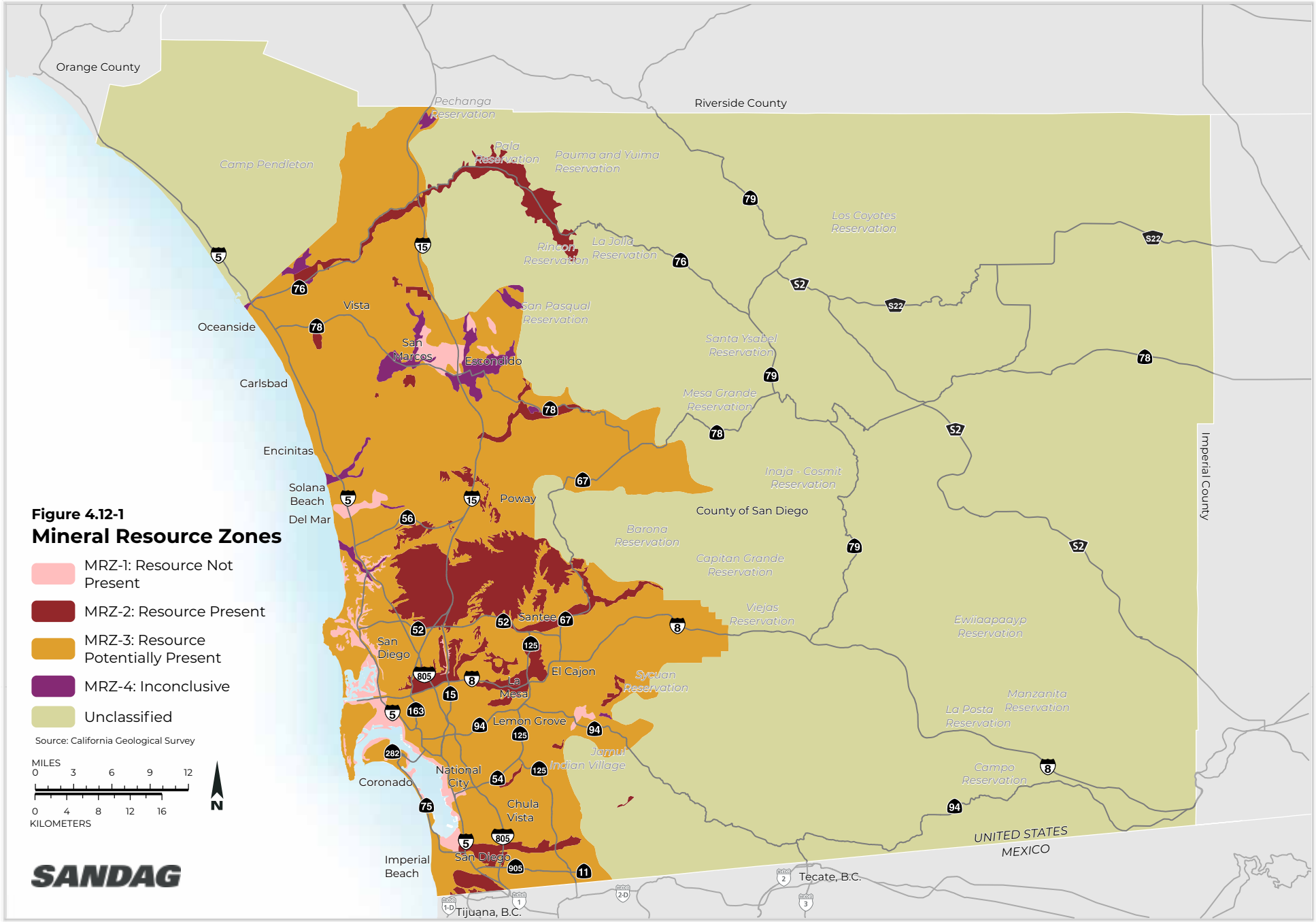
MINERAL RESOURCE ZONES

The State Surface Mining and Reclamation Act of 1975 (SMARA, Public Resources Code Sections 2710-2796) establishes policies for the conservation, development, and reclamation of valuable mineral resources, and requires cities and counties to incorporate in their general plans the mapped locations of lands categorized by the State Mining and Geology Board (SMGB) as MRZs. The primary objective of the classification and designation processes is to ensure, through appropriate lead agency policies and procedures, that mineral deposits of statewide or regional significance are available when needed (SANDAG 2011). MRZs are described in Table 4.12-1. *Resource recovery sites* are areas where mineral resources could be extracted for use and are designated in local land use plans. MRZs in the San Diego region are depicted in Figure 4.12-1.

Table 4.12-1
Description of Mineral Zones

Zone	Description
MRZ-1	Areas where available geological information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
MRZ-2	Areas underlain by mineral deposits where geological data show that significant measured or indicated resources are present or where geological information indicates that significant inferred resources are likely to be present.
MRZ-3	Areas containing known mineral deposits that may qualify as mineral resources. These areas are considered to have a moderate potential to qualify as mineral resources or they occur in geologic settings which appear to be favorable environments for specific mineral deposits.
MRZ-4	Areas where geologic information does not rule out either the presence or absence of mineral resources.

Source: SMGB 2018.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
La Posta Reservation
Manzanita Reservation
Jamul Indian Village
Campo Reservation
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.
Figure 4.12-1
Mineral Resource Zones
MRZ-1: Resource Not Present
MRZ-2: Resource Present
MRZ-3: Resource Potentially Present
MRZ-4: Inconclusive
Unclassified
Source: California Geological Survey
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

As shown in Figure 4.12-1, the majority of the western portion of the San Diego region is categorized as MRZ-3. As described in Table 4.12-1, the MRZ-3 category is given to areas containing known mineral deposits that have a moderate potential to qualify as mineral resources or that occur in geologic settings that appear to be favorable environments for specific mineral deposits.

The MRZ-1 and MRZ-4 areas make up a small portion of the San Diego region. It is important to note that there is a distinction between MRZ-1 and MRZ-4 categories, which is relevant for land-use considerations. As indicated in Table 4.12-1, the MRZ-1 category is given to areas where the available geological information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence. The MRZ-4 category, however, does not imply that there is a low likelihood for the presence of mineral resources; rather, the MRZ-4 category indicates that there is a lack of knowledge regarding the presence of mineral resources. Further exploration would be required in the reclassification of MRZ-4 lands if there is evidence that a mineral resource is present.

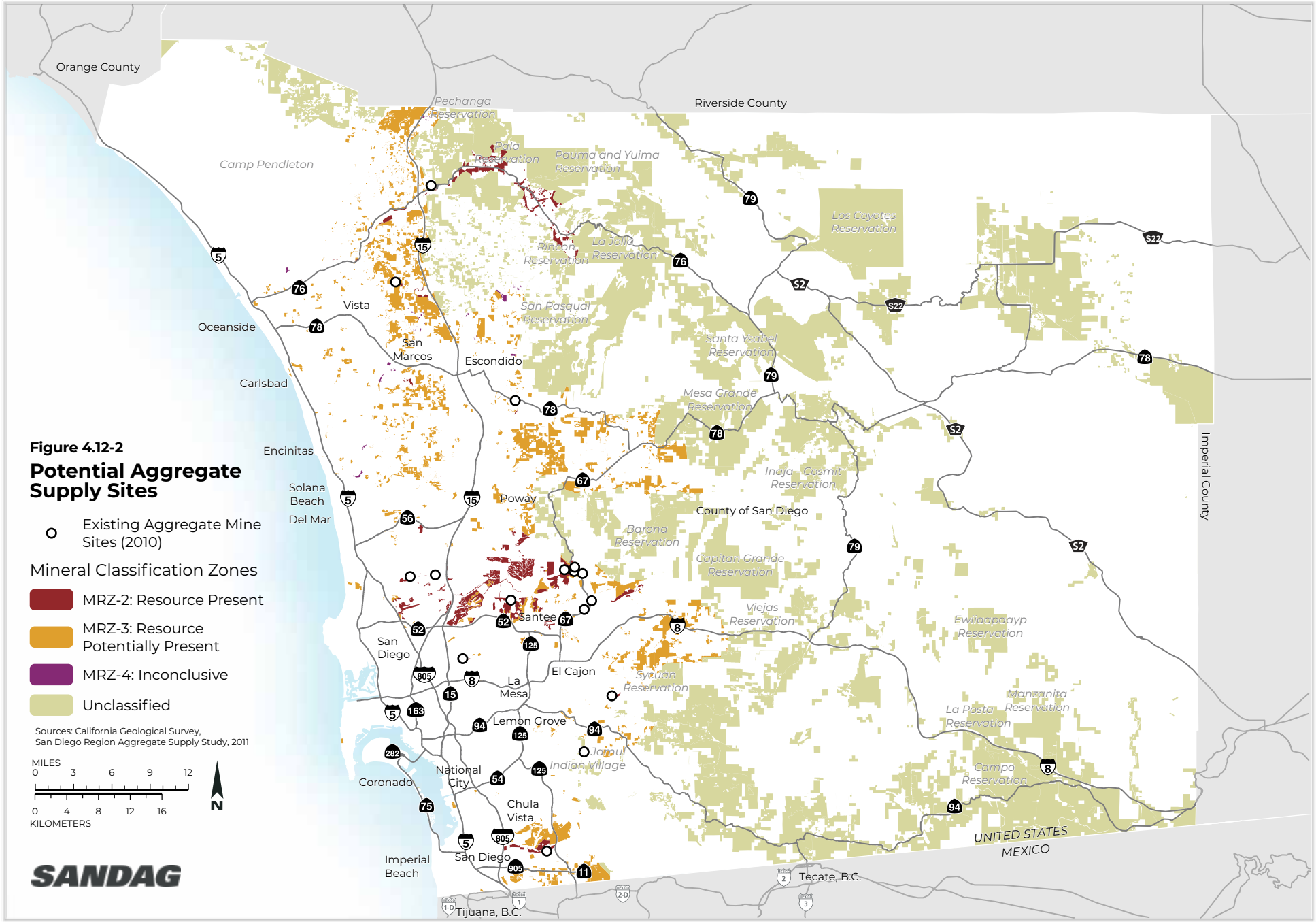
Areas designated as MRZ-2 are those underlain by mineral deposits where geological data show that significant measured or indicated resources are present, or where geological information indicates that significant inferred resources are likely to be present. Of the four MRZ categories, MRZ-2 has the highest potential to contain known significant mineral resource deposits. The existing MRZ-2 areas in the San Diego region are concentrated along major drainages such as the San Luis Rey River (along State Route [SR] 76 between Interstate [I-] 15 and SR 78), Otay River, the Tijuana River, the San Diego River, Carroll Canyon, Sweetwater River, and the San Dieguito River. As a result, many of the region's existing mining operations are located along rivers and water courses.

AGGREGATE SUPPLY AND DEMAND

Construction aggregate is the largest nonfuel mineral commodity produced in California (SANDAG 2011). Aggregate materials include sand, gravel, and crushed stone, and are key ingredients in concrete and asphalt essential for constructing and maintaining the physical framework of buildings and infrastructure. Aggregate is used for the construction of roads and rails, parking lots, buildings, homes, schools, hospitals, shopping centers, and other essential facilities. SANDAG, in cooperation with California Department of Transportation (Caltrans) District 11, completed the *San Diego Region Aggregate Supply Study* in January 2011 to examine supply issues related to aggregate in the San Diego region (SANDAG 2011). According to the study, the San Diego region has geologic sources of the necessary rock types to meet anticipated future aggregate demand, but urban development has reduced or eliminated access to these resources, causing mining to become infeasible in many areas where prime deposits of sand, gravel, and stone are located. Active aggregate supply sources within the San Diego region declined from 48 mines in 1980 to 16 by 2011, and this decline is likely to continue over the next two decades as mining permits expire and resources are depleted. As of 2011, aggregate was also being imported to the region by truck from nearby counties, and by truck and barge from Mexico to provide needed materials. Figure 4.12-2 shows the locations of potential aggregate supply sites in the San Diego region.

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

Climate impacts such as wildfires, flooding, and sea-level rise, may affect mineral resources by damaging mining sites (ICMM 2013); however, studies have not quantified the extent of these effects in the San Diego region. The San Diego region is likely to experience a longer and less predictable fire season, wetter winters and more intense precipitation that can lead to increased flooding, and sea-level rise of up to 1.2 feet by 2050. More details on future climate projections are available in Appendix C.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
La Jolla Reservation
Rincon Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
La Posta Reservation
Manzanita Reservation
Campo Reservation
Jamul Indian Village
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tecate, B.C.
Tijuana, B.C.
Figure 4.12-2
Potential Aggregate Supply Sites
Existing Aggregate Mine Sites (2010)
Mineral Classification Zones
MRZ-2: Resource Present
MRZ-3: Resource Potentially Present
MRZ-4: Inconclusive
Unclassified
Sources: California Geological Survey, San Diego Region Aggregate Supply Study, 2011
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

4.12.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Indian Mineral Development Act of 1982

The Indian Mineral Development Act (25 United States Code [USC] Sections 2101–2108) outlines provisions for Minerals Agreement contracts for tribal nations. Subject to the approval of the Secretary of the Bureau of Indian Affairs (BIA), and any limitation or provision contained in its constitution or charter, tribes may enter into certain agreements providing for the exploration for, or extraction, processing, or other development of, energy and nonenergy mineral resources for which tribes own a beneficial or restricted interest, or providing for the sale or other disposition of the production or products of tribal mineral resources.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

Surface Mining and Reclamation Act of 1975

SMARA requires cities and counties to incorporate in their general plans certain mapped designations, including lands categorized as MRZs. MRZ classifications are set forth in guidelines developed by the SMGB (2018) and are used to communicate information concerning the location of mineral resources. Mineral lands are mapped according to jurisdictional boundaries (e.g., counties, groups of counties, or major parts of counties), mapping all mineral commodities in the area, including aggregate. Priority is given to areas where future mineral resource extraction could be precluded by incompatible land use or to mineral resources likely to be mined during the 50-year period following their classification.

Section 2762(d) of SMARA establishes specific lead agency noticing requirements prior to permitting a use that would threaten the potential for future extraction of identified mineral resources from either (1) MRZ-2 lands, or (2) land designated in a lead agency's general plan as having important minerals to be protected. Prior to permitting a use that would threaten the potential to extract minerals in lands with either of these two designations, the lead agency must prepare a statement specifying its reasons for permitting the proposed use and provide public notice of the statement. The statement must be forwarded to the State Geologist and SMGB for review and is required to comply with the public review requirements of CEQA.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

General Plans

To comply with California Government Code Section 65302, a general plan must include "[a] conservation element for the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources" (Section 65302 (d)). Sand, gravel, and crushed rock provide construction aggregate materials and are economically the most important mineral resource in the San Diego region (County of San Diego 2011). The locations of mineral resources, if any, are identified in each general plan; policies and regulations for extraction activities are addressed in general plans and local codes as shown in Table 4.12-2.

Table 4.12-2
Policies or Regulations by Jurisdiction

Jurisdiction	Policy or Regulation on Mineral Resources
Carlsbad	The City of Carlsbad classifies Open Space for Managed Production of Resources, including major mineral resources. (City of Carlsbad 2015).
Chula Vista	City of Chula Vista Municipal Code Section 19.69 covers surface mining regulations (City of Chula Vista 2018). The Chula Vista General Plan policies concerning mineral resources include: E 5.1 Ensure that permit applications for proposed mineral resource extraction are consistent with the Chula Vista MSCP Subarea Plan. E 5.2 Consider and minimize impacts from mining operations to existing and future surrounding land uses. E 5.3 Ensure that approved mining reclamation plans fully comply with requirements of the Chula Vista MSCP Subarea Plan; Chula Vista Greenbelt Master Plan; Otay Valley Regional Park Concept Plan; and all other applicable plans regarding the restoration of biological habitats and the creation of trails and parkland (City of Chula Vista 2005).
Coronado	The City of Coronado identifies Open Space for the managed production of resources including areas that contain mineral deposits such as bedrock, clay sand silts, and salt. The City recognizes salt ponds as a valuable resource not only for salt evaporation purposes, but also for providing habitat for birds and marine wildlife (City of Coronado 2003).
Del Mar	The City of Del Mar Municipal Code Chapter 23.32 contains provisions on excavating and grading permits (City of Del Mar 2018).
El Cajon	The City of El Cajon General Plan states that the City of El Cajon does not have any commercial deposits of ores or minerals (City of El Cajon 2001).
Encinitas	The City of Encinitas General Plan contains a policy allowing mineral resource extraction within the Coastal Zone, except in environmentally sensitive areas (City of Encinitas 2011).
Escondido	The City of Escondido General Plan Update does not include any goals or policies that specifically address mineral resources or mineral extraction (City of Escondido 2012).
Imperial Beach	The City of Imperial Beach General Plan does not include policies regarding mineral resources (City of Imperial Beach 2019).
La Mesa	The Conservation Element of the La Mesa General Plan states that La Mesa does not have any of the resources typically discussed in a conservation element, including mineral resources. The General Plan EIR does not discuss Mineral Resources (City of La Mesa 2013), and the City of La Mesa does not have policies pertaining to mineral resources (City of La Mesa 2013).
Lemon Grove	The City of Lemon Grove does not have any known mineral deposits; therefore, there are no policies pertaining to mineral resources (City of Lemon Grove 2006).
National City	The City of National City's General Plan contains language on the salt ponds of the San Diego National Wildlife Refuge. The U.S. Fish and Wildlife Service has prepared a Comprehensive Conservation Plan that includes a holistic habitat restoration plan for the existing salt works property (City of National City 2012).
Oceanside	The City of Oceanside General Plan's long-range policies include regulating mineral extraction activities to minimize hazards and conflicts with other land uses as well as to preserve and enhance the appearance of the area (City of Oceanside 2018).

Jurisdiction	Policy or Regulation on Mineral Resources
Poway	The City of Poway's General Plan states that the City's only known valuable mineral resource is construction-quality sand and gravel that is located in the southern area of the city. Currently, one sand and gravel extraction operation is located in Beeler Canyon on the southernmost portion of this area. The City's General Plan also states that areas designated as Region-Serving Open-Space (areas that are lightly developed with activities or facilities that serve the region as unique or outstanding recreational, safety, or managed production such as agriculture, mineral extraction) should be retained as open space and in some cases increased to serve the region's expanding needs (City of Poway 1991). Chapter 16.54 of the City of Poway's Municipal Code contains regulations on surface mining and reclamation.
City of San Diego	The City of San Diego General Plan includes policies to balance mineral extraction with habitat conservation. These policies include: CE-K.1. Promote the recycling and reclamation of construction materials to provide for the City's current and future growth and development needs (see also Public Facilities). Policy PF-I.1 and Conservation Element, Policy CE-A.8. CE-K.2. Permit new or expanding mining operations within the Multi-Habitat Planning Area (MHPA) in accordance with MSCP policies and guidelines. CE-K.3. Produce sand and gravel with minimal harm and disturbance to adjacent property and communities. CE-K.4. Plan rehabilitation of depleted mineral areas to facilitate reuse consistent with state requirements, the Surface Mining and Reclamation Act (SMARA), and local planning goals and policies, including the MSCP. CE-K.5. Consider local evaporative salt production for future economic value, open space use, and for important ecological habitat. (City of San Diego 2008) Section 141.1004 of the City's Municipal Code covers regulations pertaining to mining and extractive industries.
San Marcos	According to the San Marcos General Plan, the City currently does not have active mines or quarries, though two historical mining/quarry locations exist within City limits. The City will maintain awareness and comply with State policies regarding protection and extraction of these resources (City of San Marcos 2012). City of S.an Marcos Zoning Ordinance Chapter 20.460 covers regulations pertaining to surface mining.
Santee	According to the City of Santee's General Plan, Santee includes a number of areas containing valuable mineral (primarily sand and gravel) resources. These include areas along the San Diego River, within hilly areas north of Carlton Hills, south of Prospect Avenue between Mesa Road and Fanita Drive, and at the north end of Magnolia Avenue. In view of the potential environmental and flooding problems associated with the mining of these resources, the City of Santee needs to carefully review and regulate all sand mining and mineral recovery proposals (City of Santee 2003). The City's General Plan contains specific policies concerning mineral resources: Policy 5.1 The City shall require that all proposed mining operations are adequately reviewed during the project and environmental review processes to minimize to the greatest degree possible, all identified environmental impacts, especially water quality, habitat preservation and bridge undermining. Policy 6.1: The City shall require the planned reclamation of mined lands following extraction of mineral resources with consideration of the land's potential for recreational, wildlife habitat, and scenic uses as well as for residential, industrial or commercial development (City of Santee 2003). Title 15, Chapter 15.58, Article VI of the City's Municipal Code covers regulations pertaining to surface mining and reclamation.

Jurisdiction	Policy or Regulation on Mineral Resources
Solana Beach	The Conservation and Open Space Element of the City of Solana Beach General Plan states that open space is used for the managed production of resource including areas containing mineral deposits (City of Solana Beach 2014).
Vista	The City of Vista General Plan does not have policies regarding the extraction of mineral resources (City of Vista 2012); however, the General Plan Update EIR states that all future development associated with the General Plan Update would undergo individual review to ensure that significant mineral resources are protected (City of Vista 2012).
County of San Diego	San Diego County Zoning Ordinance, Section 2820 et seq., known as the S82 Extractive Use Regulations (County of San Diego 1978), are intended to identify and create areas within the County where mining, quarrying, or oil extractive uses are permitted. Typically, the S82 Extractive Use Regulations would be applied to areas of mineral deposits to signify the presence of such deposit and notify adjacent or affected properties of the intention to allow extraction of minerals within the zone. These regulations are used to preserve areas with valuable mineral deposits until extraction can take place. San Diego County Zoning Ordinance, Section 6550 et seq. (Extractive Use Regulations) provide the means for public review and regulation of mineral extraction and associated on-site processing operations. County of San Diego Code of Regulatory Ordinances Section 87.701-87.714 regulates all surface mining operations in the unincorporated area of the County of San Diego as authorized by the San Diego County Zoning Ordinance and SMARA. The objectives of these regulations are: a. The continued mining of minerals will be permitted in a manner which will protect the public health and safety and will provide for the protection and subsequent beneficial use of mined and reclaimed land; and b. The possible adverse effects of surface mining operations on the environment, including air pollution, impedance of groundwater movement, water quality degradation, damage to aquatic or wildlife habitat, flooding, erosion and sedimentation, will be prevented or minimized; and c. The production and conservation of minerals will be encouraged while giving consideration to values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment.

Source: Data compiled by ICF in 2018.

4.12.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the CEQA Guidelines Appendix G checklist questions. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, the unique nature of the proposed Plan's mineral resources impacts, and the unique characteristics of the proposed Plan.

Checklist questions for mineral resources are provided in Section XII of CEQA Guidelines Appendix G. To streamline the analysis, the two separate mineral resources criteria (a) and (b) in CEQA Guidelines Appendix G, which are closely related, have been combined as MR-1 for the purposes of this EIR, implementation of the proposed Plan would have a significant mineral resources impact if it would:

MR-1 Result in the loss of availability of known aggregate and mineral resources supply sites that would be of value to the region and the residents of the state, or result in the loss of availability of a locally-important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan.

4.12.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

MR-1 **RESULT IN THE LOSS OF AVAILABILITY OF KNOWN AGGREGATE AND MINERAL RESOURCES SUPPLY SITES THAT WOULD BE OF VALUE TO THE REGION AND THE RESIDENTS OF THE STATE, OR RESULT IN THE LOSS OF AVAILABILITY OF A LOCALLY-IMPORTANT MINERAL RESOURCE RECOVERY SITE DELINEATED IN A LOCAL GENERAL PLAN, SPECIFIC PLAN, OR OTHER LAND USE PLAN**

ANALYSIS METHODOLOGY

A significant impact on mineral resources would occur if implementation of regional growth and land use change or transportation network improvements and programs would result in the loss of availability of known aggregate supply sites and mineral resources that would be of value to the region and the residents of the state. Mapped MRZ-2 lands from the California Geological Survey (CGS 1996) are used for this analysis because this is the only MRZ classification defined by the SMGB that identifies known mineral resources. In addition to mapped MRZ-2 data, regional aggregate supply site information from SANDAG's 2011 *San Diego Region Aggregate Supply Study* is used in this impact analysis. The analysis quantifies direct impacts of regional growth and transportation network improvements that would occur on lands designated as MRZ-2, or identified as potential aggregate supply sites by SANDAG, that would potentially be available for extraction of mineral resources. Direct impacts on MRZ-2 and aggregate supply sites are quantified separately for each horizon year using data compiled from CGS and SANDAG. Tables M-1 through M-4 of Appendix M list the total acres of undeveloped MRZ-2 and aggregate supply sites converted to developed land and transportation network improvements.

In addition, locations of locally important mineral resource recovery sites delineated in local plans are identified to determine whether they are included in MRZ-2 data and aggregate supply site data used to calculate direct impacts. If not, those sites are analyzed separately to determine if a significant impact would occur.

Indirect impacts on mineral resources are analyzed qualitatively by considering the effects of forecasted changes in land use and transportation network improvements that would be incompatible with current or future mining operations in locations where mineral resources are present. Incompatible land uses would include those such as residential, institutional (e.g., schools, hospitals) or environmentally sensitive open space areas, where social or environmental factors make it unlikely that resources would be mined nearby.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Lands designated as MRZ-2 locations are areas with known mineral resources. As shown in Figure 4.12-1, MRZ-2 locations exist along many of the major waterways in San Diego County, several of which are also the route of regional highways. In the north part of the county, these include SR 76 along the San Luis Rey River and along the San Dieguito River between I-15 and SR 78; in the central part of the county, MRZ-2 areas are found in the hills north of SR 52 and east of I-805, and along the San Diego River, including along I-8; in the south part of the county they occur along the Otay River in south Chula Vista and Otay Mesa, and from Imperial Beach south to the U.S./Mexican border along the Tijuana River. Resource recovery sites are areas where mineral resources could be extracted for use. Locally important resource recovery sites or areas where important resource recovery sites could potentially be located, or where mines are currently operating, are designated by the CGS as MRZ-2 or MRZ-3, as shown on Figure 4.12-1. In 2025, regional growth and land use changes would result in the loss of approximately 789 acres of undeveloped MRZ-2 land to developed land throughout the region, resulting in the loss of known mineral resources and mineral resource recovery sites over 2016 conditions (CGS 1996).

Permanent loss of availability to land containing mineral resources in the region is caused by the development of incompatible uses, which directly or indirectly makes the resource inaccessible for future extraction. To accommodate regional growth and land use change by 2025, portions of vacant and undeveloped land in MRZ-2 locations would be developed for land uses considered incompatible with mining operations.

Although there are several places in the San Diego region where active mining operations have functioned in proximity to urban development, such as Mission Valley or Carroll Canyon in the City of San Diego, residential development typically restricts the availability of lands for mining operations. Noise from quarry and mining activities is typically the largest environmental impact on nearby noise-sensitive land uses (such as residential developments, industrial developments, commercial developments, and major public facilities). Residents can be concerned about potential dust, noise, blasting vibrations, truck traffic, unsightly scars on the land, and loss of habitat caused by aggregate mining. Aggregate, a regionally important mineral resource, is found in portions of MRZ-2 locations, as seen in Figure 4.12-2. In 2025, aggregate mining along river or creek corridors could coincide with development in Mobility Hubs that include waterways.

Therefore, regional growth and land use change under the proposed Plan would result in the loss of availability of known aggregate and mineral resources that would be of value to the region and the residents of the state, and result in the loss of availability of a locally important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan. This impact would be significant.

Transportation Network Improvements and Programs

In 2025, transportation network improvements and programs would result in loss of approximately 11 acres of undeveloped MRZ-2 lands, primarily due to the Carlton Oaks Segment of the San Diego River Trail in the Cities of San Diego and Santee and the Heritage Road Bridge Project in the City of Chula Vista, resulting in the loss of known mineral resources and mineral resource recovery sites over 2016 conditions (CGS 1996). This impact would be significant.

2025 Conclusion

Implementation of regional growth and land use change, as well as transportation network improvements and programs would result in the loss of availability of known aggregate or other mineral resources, as well as the loss of availability of locally important mineral resource recovery sites, including the loss of 800 acres of MRZ-2 lands. Therefore, this impact (MR-1) is significant in the year 2025.

2035

Regional Growth and Land Use Change

Additional vacant and undeveloped land in MRZ-2 locations would be developed for uses considered incompatible with mining operations. Development to accommodate regional growth and land use change would be constructed throughout the region. Up to 2035, regional growth and land use changes would result in the loss of approximately 803 acres of undeveloped MRZ-2 land, with only 14 acres of new impacts scattered around the region over 2025. Nevertheless, these impacts would result in the loss of known mineral resources and mineral resource recovery sites (CGS 1996). Therefore, regional growth and land use change under the proposed Plan would result in the loss of availability of known aggregate and mineral resources that would be of value to the region and the residents of the state, and result in the loss of availability of a locally important mineral resource recovery site delineated in a local general plan, community plan, specific plan, or other land use plan. This impact would be significant.

Transportation Network Improvements and Programs

In 2035, transportation network improvements and programs would result in the loss of approximately 23 acres of undeveloped MRZ-2 land. New impacts between 2025 and 2035 are primarily due to the Mast Park to Lakeside baseball park section of the San Diego River Trail in the City of Santee, SR 52 Complete Corridor Managed Lanes, and Commuter Rail 582. These projects would result in the loss of known mineral resources and mineral resource recovery sites over 2016 conditions (CGS 1996, 2006). The development of the Central Mobility Hub and San Ysidro Mobility Hub is located in the established communities of the City of San Diego and is not expected to impact known mineral resources. Therefore, this impact (MR-1) is significant in the year 2035.

2035 Conclusion

Implementation of regional growth and land use change, as well as transportation network improvements and programs, would result in the loss of availability of known aggregate or other mineral resources, as well as the loss of availability of locally important mineral resource recovery sites, including loss of 826 acres of MRZ-2 lands. Therefore, this impact (MR-1) is significant in the year 2035.

2050

Regional Growth and Land Use Change

Additional vacant and undeveloped land in MRZ-2 locations would be developed for uses considered incompatible with mining operations. Development to accommodate regional growth and land use change would be constructed throughout the region. Up to 2050, regional growth and land use change would result in the loss of approximately 817 acres of undeveloped MRZ-2 land, with only 14 additional acres of new impacts scattered across the region over those of 2035. Nevertheless, these impacts would result in the loss of known

mineral resources and mineral resource recovery sites (CGS 1996, 2006). Therefore, regional growth and land use change under the proposed Plan would result in the loss of availability of known aggregate and mineral resources that would be of value to the region and the residents of the state, and result in the loss of availability of a locally important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan. This impact would be significant.

Transportation Network Improvements and Programs

In 2050, transportation network improvements and programs would result in loss of 36 acres of undeveloped MRZ-2 land. New impacts to mineral resources between 2035 and 2050 are primarily due to the I-5 to Santo Road segment of the SR 52 Bikeway, and the San Luis Rey River Trail. These projects would result in the loss of known mineral resources and mineral resource recovery sites over 2016 conditions (CGS 1996, 2006). This impact would be significant.

2050 Conclusion

Implementation of regional growth and land use change, as well as transportation network improvements and programs, would result in the loss of availability of known aggregate or other mineral resources, as well as the loss of availability of locally important mineral resource recovery sites, including the loss of 853 acres of MRZ-2 lands. Therefore, this impact (MR-1) is significant in the year 2050.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan is not expected to exacerbate climate change effects on mineral resources. While climate change may affect mineral resources through potential damage to mining sites, the proposed Plan is not expected to interact with climate change in a way that would exacerbate these climate change effects.

MITIGATION MEASURES

MR-1 RESULT IN THE LOSS OF AVAILABILITY OF KNOWN AGGREGATE AND MINERAL RESOURCES SUPPLY SITES THAT WOULD BE OF VALUE TO THE REGION AND THE RESIDENTS OF THE STATE, OR RESULT IN THE LOSS OF AVAILABILITY OF A LOCALLY-IMPORTANT MINERAL RESOURCE RECOVERY SITE DELINEATED IN A LOCAL GENERAL PLAN, SPECIFIC PLAN, OR OTHER LAND USE PLAN

2025, 2035, and 2050

MR-1a Conserve Aggregate and Mineral Resources During Planning and Design of Development Projects. During planning, design, and project-level CEQA review of development projects, the County of San Diego, cities, and other local jurisdictions can and should avoid or reduce impacts on known aggregate and mineral resources and locally important mineral resource recovery sites through the evaluation and selection of project sites and design features (e.g., buffers) that minimize direct and indirect impacts on these lands. Aggregate and mineral resource areas, especially MRZ-2 areas, should be maintained in open space or other general plan land use and zoning designations that allow for extraction of mineral resources.

MR-1b Conserve Aggregate and Mineral Resources During Planning and Design of Transportation Network Improvements. During planning, design, and project-level CEQA review of transportation network improvements, SANDAG shall, and other transportation project sponsors can and should, avoid loss of known aggregate and mineral resources and locally important mineral resource recovery sites, where feasible. Where

avoidance is infeasible, SANDAG shall, and other transportation project sponsors can and should, minimize direct and indirect impacts on the availability of known resources and recovery sites through measures that include, but are not limited to, the following:

- Designing transportation network improvements in a manner (such as buffer zones or the use of screening) that do not preclude adjacent or nearby extraction of aggregate and mineral resources following completion of the improvement and during long-term operations.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of the proposed Plan would result in the loss of availability of known aggregate or other mineral resources, as well as the loss of availability of locally important mineral resource recovery sites. Mitigation measures MR-1a and MR-1b would reduce the impact associated with the loss of availability of known mineral resources and mineral resource recovery sites, but not to less-than-significant levels because they would not prevent impacts on all MRZ-2 zoned lands. Additionally, design features that reduce the impact associated with the loss of availability of known mineral resources and mineral resource recovery sites may not reduce impacts to less than significant for all projects. Therefore, this impact (MR-1) remains significant and unavoidable.

4.13 NOISE AND VIBRATION

This section evaluates the noise and vibration impacts of the proposed Plan. The information presented was compiled from multiple sources, including SANDAG and other transportation project sponsors, the California Department of Transportation (Caltrans), the County of San Diego, cities, and other local jurisdictions.

4.13.1 EXISTING CONDITIONS

Noise Fundamentals

This section describes widely published and generally accepted concepts related to airborne noise (Caltrans 2011b, 2013a; FTA 2018). Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air or water) to a hearing organ, such as a human ear. Noise is often defined as sound that is objectionable because it is unwanted, disturbing, or annoying. In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and the characteristics of the propagation path to the receptor determine the sound level and the characteristics of the noise perceived by the receptor. The following sections provide an explanation of key concepts and acoustical terms used in the analysis of environmental and community noise.

Frequency, Amplitude, and Decibels

Continuous sound can be described by its *frequency* (pitch) and *amplitude* (loudness). A low-frequency sound is perceived as low in pitch; a high-frequency sound is perceived as high-pitched. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source correlates with the loudness of that source. The amplitude of a sound is described in terms of *sound pressure level* (SPL), also referred to simply as the sound level. The SPL is typically described using a logarithmic scale in terms of decibels, abbreviated dB.

Because decibels represent SPL using a logarithmic scale, sound levels cannot be added, subtracted, or averaged through ordinary arithmetic. On the dB scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing the same SPL at a given receiver location, the total noise level would be 3 dB higher than for a single source under the same conditions. For example, 60 dB plus 60 dB equals 63 dB, and 80 dB plus 80 dB equals 83 dB. However, where ambient noise levels are high in comparison to a new noise source, there will be only a small change in overall noise levels when the new source is added. For example, when an ambient noise level of 70 dB is combined with a new source of 60 dB the resulting total noise level equals 70.4 dB.

Similarly, the arithmetic mean (average) of a series of noise levels does not accurately represent the overall average noise level. Instead, the values must be averaged using a linear scale before converting the result back into a logarithmic (dB) noise level. This method is typically referred to as calculating the “energy average” of the noise levels. The same decibel calculations are used for A-weighted decibels described below.

A-Weighting

The dB scale alone does not adequately characterize how humans perceive noise. Because the human ear is not equally sensitive to all frequencies within the sound spectrum, the frequency content of a sound has a substantial effect on the human response to that sound. In general, people are most sensitive to the frequency range of 1,000 to 5,000 Hz and perceive both higher and lower frequency sounds of the same amplitude with less intensity. To approximate the response of the human ear, sound levels in various frequency bands are adjusted (or "weighted"), depending on the human sensitivity to those frequencies. The resulting SPL is expressed in A-weighted decibels, abbreviated dBA. When people make judgments regarding the relative loudness or annoyance of a sound, their judgments correlate well with the A-weighted sound levels of those sounds. Table 4.13-1 describes typical A-weighted sound levels for various noise sources.

Table 4.13-1
Typical Noise Levels in the Environment

Common Outdoor Noise Source	Sound Level (dBA)	Common Indoor Noise Source
	— 110 —	Rock band
Jet flying at 1,000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower at 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher in next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: California Department of Transportation 2013a.

Noise Descriptors

Because sound levels can vary markedly over a short period of time, various descriptors or noise "metrics" have been developed to quantify environmental and community noise. These metrics generally describe either the average character of the noise or the statistical behavior of the variations in the noise level. Some of the most common metrics used to describe environmental noise, including those metrics used in this EIR, are described below.

Equivalent Sound Level (L_{eq}) is the most common metric used to describe short-term average noise levels. The L_{eq} describes the average acoustical energy content of noise for an identified period of time, commonly 1 hour.

Maximum Sound Level (L_{max}) and **Minimum Sound Level (L_{min})** refer to the maximum and minimum sound levels, respectively, that occur during the noise measurement period. More specifically, they describe the root-mean-square sound levels that correspond to the loudest and quietest 1-second intervals that occur during the measurement.

Percentile-Exceeded Sound Level (L_{xx}) describes the sound level exceeded for a given percentage of a specified period. For example, the L_{50} is the sound level exceeded 50 percent of the time (such as 30 minutes per hour), and L_{25} is the sound level exceeded 25 percent of the time (such as 15 minutes per hour).

Community Noise Equivalent Level (CNEL) is a measure of the 24-hour average A-weighted noise level that is also time-weighted to "penalize" noise that occurs during the evening and nighttime hours when noise is generally recognized to be more disturbing (because people are trying to rest, relax, and sleep during these times). 5 dBA is added to the L_{eq} during the evening hours of 7 p.m. to 10 p.m., and 10 dBA is added to the L_{eq} during the nighttime hours of 10 p.m. to 7 a.m., and the energy average is then taken for the whole 24-hour day.

Day-Night Sound Level (L_{dn}) is very similar to the CNEL described above. L_{dn} is also a time-weighted average of the 24-hour A-weighted noise level. The only difference is that no "penalty" is applied to the evening hours of 7 p.m. to 10 p.m. 10 dBA is added to the L_{eq} during the nighttime hours of 10 p.m. to 7 a.m., and the energy average is then taken for the whole 24-hour day

It is noted that various federal, State, and local agencies have adopted CNEL or L_{dn} as the measure of community noise. While not identical, CNEL and L_{dn} are normally within 1 dBA of each other when measured in typical community environments, and many noise standards/regulations use the two interchangeably.

Sound Propagation

When sound propagates over a distance, it changes in both level and frequency content. The manner in which noise is reduced with distance depends on the following important factors.

Geometric Spreading. Sound from a single source (i.e., a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (or drops off) at a rate of 6 dBA for each doubling of distance. Highway noise is not a single stationary point source of sound. The movement of vehicles on a highway makes the source of the sound appear to emanate from a line (i.e., a "line" source) rather than from a point. This results in cylindrical spreading rather than the spherical spreading resulting from a point source. The change in sound level (i.e., attenuation or decrease) from a line source is 3 dBA per doubling of distance.

Ground Absorption. Usually the noise path between the source and the observer is very close to the ground. The excess noise attenuation from ground absorption occurs due to acoustic energy losses on sound wave reflection. For acoustically absorptive or "soft" sites (i.e., sites with an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dBA per doubling of distance is normally assumed. When added to the geometric spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dBA per doubling of distance for a line source and 7.5 dBA per doubling of distance for a point source for propagation over soft sites.

Atmospheric Effects. Research by Caltrans (2013a) and others has shown that atmospheric conditions can have a major effect on noise levels. Factors include wind, air temperature (including vertical temperature gradients), humidity, and turbulence. Receptors downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas receptors upwind can have lower noise levels. Increased sound levels can also occur over relatively large distances because of temperature inversion conditions (i.e., increasing air temperature with elevation).

Shielding by Natural or Human-Made Features. A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by this shielding depends on the size of the object, proximity to the noise source and receptor, surface weight, solidity, and the frequency content of the noise source. Natural terrain features (such as hills and dense woods) and human-made features (such as buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receptor with the specific purpose of reducing noise. In addition to the noise that diffracts over the top of a barrier, noise will also diffract around the ends of the barrier, leading to "flanking" noise that can reduce the overall efficacy of the barrier. Assuming it is long enough to minimize the effects of flanking noise, a barrier that breaks the line of sight between a source and a receptor will typically result in at least 5 dB of noise reduction. A taller barrier may provide as much as 20 dB of noise reduction.

Human Response to Noise

Noise-sensitive receptors (also called "receivers") are locations where people reside or where the presence of unwanted sound may adversely affect the use of the land (see *Noise-Sensitive Land Uses*, below). Noise can have a range of effects on people including hearing damage, sleep interference, speech interference, performance interference, physiological responses, and annoyance (Caltrans 2013a, WHO 1999). Each of these is briefly described below.

Hearing Damage. A person exposed to high noise levels can suffer either gradual or traumatic hearing damage. Gradual hearing loss occurs with repeated exposure to excessive noise levels and is most commonly associated with occupational noise exposures in heavy industry or other very noisy work environments. Traumatic hearing loss is caused by sudden exposure to an extremely high noise level, such as a gunshot or explosion at very close range. The potential for noise-induced hearing loss is not generally a concern in typical community noise environments. Noise levels in neighborhoods, even in very noisy airport environs, are not sufficiently loud as to cause hearing loss.

Sleep Interference. Exposure to excessive noise levels at night has been shown to cause sleep disturbance. Sleep disturbance refers not only to awakening from sleep, but also to effects on the quality of sleep such as altering the pattern and stages of sleep. World Health Organization (WHO) guidelines recommend noise limits of 30 dBA L_{eq} (8-hour average) for continuous noise and 45 dBA L_{max} for single sound events inside bedrooms at night to minimize sleep disturbance (WHO 1999).

Speech Interference. Speech interference can be a problem in any situation where clear communication is desired, but is often of particular concern in learning environments (such as schools) or situations where poor communication could jeopardize safety. Normal conversational speech inside homes is typically in the range of 50 to 65 dBA (EPA 1977), and any noise in this range or louder may interfere with speech. As background noise levels rise, the intelligibility of speech decreases and the listener will fail to recognize an increasing percentage of the words spoken. A speaker may raise his or her voice in an attempt to compensate for higher background noise levels, but this in turn can lead to vocal fatigue for the speaker.

Performance Interference. Excessive noise has been found to have various detrimental effects on human performance, including information processing, concentration, accuracy, reaction times, and academic performance. Intrusive noise from individual events can also cause distraction. These effects are of obvious concern for learning and work environments.

Physiological Responses. Acute noise has been shown to cause measurable physiological responses in humans, including changes in stress hormone levels, pulse rate, and blood pressure. The extent to which these responses cause harm or are signs of harm is not clearly defined, but it has been postulated that they could contribute to stress-related diseases, such as hypertension, anxiety, and heart disease. However, research indicates links between environmental noise and permanent health effects are generally weak and inconsistent. Statistically significant health risks have been found for extended exposure to very high noise levels, such as for workers exposed to high levels of industrial noise for 5 to 30 years (WHO 1999).

Annoyance. The subjective effects of annoyance, nuisance, and dissatisfaction are possibly the most difficult to quantify, and no completely satisfactory method exists to measure these effects. This difficulty arises primarily from differences in individual sensitivity and habituation to sound, which can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing acuity. An important tool in estimating the likelihood of annoyance due to a new sound is by comparing it to the existing baseline or "ambient" environment to which that person has adapted. In general, the more the level or tonal (frequency) variations of a sound exceed the previously existing ambient sound level or tonal quality, the less acceptable the new sound will be, as judged by the exposed individual.

In most cases, effects from sounds typically found in the natural environment would be limited to annoyance or interference. Physiological effects and hearing loss would be more commonly associated with human-made noise, such as in an industrial or an occupational setting.

Studies have shown that under controlled conditions in an acoustics laboratory, a healthy human ear is able to discern changes in sound levels of 1 dBA. In the normal environment, the healthy human ear can detect changes of about 2 dBA; however, it is widely accepted that a doubling of sound energy, which results in a change of 3 dBA in the normal environment, is considered just noticeable to most people. A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as being twice as loud.

Noise-Sensitive Land Uses

Sensitive noise receptors are generally considered persons who occupy land uses where noise is an important attribute of the environment for activities that require quiet, including sleeping, convalescing, and studying. These land uses typically include residential dwellings, hotels/motels, hospitals, nursing homes, educational facilities, and libraries. Each city or county typically provides a list of noise-sensitive receptors to consider in their general plan noise element and/or noise ordinance. Protected wildlife (special-status species) and their habitat may also be considered noise-sensitive receptors, especially during the species breeding season, such as protected nesting birds.

GROUNDBORNE VIBRATION FUNDAMENTALS

This section describes widely published and generally accepted concepts related to groundborne vibration (Caltrans 2013b, FTA 2018). Groundborne vibration is a small, rapidly fluctuating motion transmitted through the ground. The effects of groundborne vibrations are typically limited to causing nuisance or annoyance to people, but at extreme vibration levels damage to buildings may also occur.

In contrast to airborne sound, groundborne vibration is not a phenomenon that most people experience every day. The ambient groundborne vibration level in residential areas is usually much lower than the threshold of human perception. Most perceptible indoor vibration is caused by sources within buildings, such as mechanical equipment while in operation, people moving, or doors slamming. Typical outdoor sources of perceptible groundborne vibration are heavy construction activity (such as blasting, pile driving, or earthmoving), steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible, even in locations close to major roads. The strength of groundborne vibration from typical environmental sources diminishes (or attenuates) rapidly over distance.

For the prediction of groundborne vibration, the fundamental model consists of a vibration source, a receptor, and the propagation path between the two. The power of the vibration source and the characteristics and geology of the intervening ground, which affect the propagation path to the receptor, determine the groundborne vibration level and the characteristics of the vibration perceived by the receptor.

Groundborne noise occurs when vibration propagating through a building causes room surfaces to vibrate and radiate noise into interior spaces. Many vibration sources, such as heavy construction and steel-wheeled trains, also generate substantial levels of airborne noise. This airborne noise typically dominates the overall noise level such that any groundborne noise contribution is negligible to a person inside the building. Groundborne noise is typically only an issue for scenarios that do not generate high levels of airborne noise at the receiver location. Examples include subway or tunnel operations where there is no airborne noise path or situations where people are located in buildings with substantial sound insulation, such as a recording studios. Groundborne noise is typically quantified using the A-weighted sound level.

Frequency and Amplitude

The frequency of a vibrating object describes how rapidly it is oscillating. The unit of measurement for the frequency of vibration is Hz (the same as used in the measurement of noise), which describes the number of cycles per second.

The amplitude of vibration can be measured in terms of displacement, velocity, or acceleration. Displacement describes the distance that a particle moves from its resting (or equilibrium) position as it oscillates and can be measured in inches. The amplitude of vibration velocity (the speed of the movement) can be measured in inches per second (in/s). The amplitude of vibration acceleration (the rate of change of the speed) can be measured in inches per second per second (in/s^2).

Vibration Descriptors

As noted above, there are various way to quantify groundborne vibration based on its fundamental characteristics. Because vibration can vary markedly over a short period of time, various descriptors have been developed to quantify vibration. The two most common descriptors used in the analysis of groundborne vibration are *peak particle velocity* and *vibration velocity level*, each of which are described below.

Peak Particle Velocity (PPV) is defined as the maximum instantaneous positive or negative peak amplitude of the vibration velocity. The unit of measurement for PPV is inches per second (in/s). Unlike many quantities used in the study of environmental acoustics, PPV is typically presented using linear values and does not employ a dB scale.

Vibration Velocity Level (L_V) describes the root-mean-square (RMS) vibration velocity. L_V is essentially a "smoothed" value that quantifies the average vibration amplitude over a 1-second period. L_V is reported on

a logarithmic decibel scale with the abbreviation VdB commonly used to distinguish vibration decibels from noise level decibels.

Vibration Propagation

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish (attenuate) with distance away from the source. High-frequency vibrations reduce much more rapidly than low frequencies so that low frequencies tend to dominate the spectrum at large distances from the source. The propagation of groundborne vibration is also influenced by geological factors such as soil conditions, depth to bedrock, soil strata, frost conditions, and water conditions.

Effects of Groundborne Vibration

Vibration can result in effects that range from annoyance to structural damage. Annoyance or disturbance of people may occur at vibration levels substantially below those that would pose a risk of damage to buildings. Each of these effects is discussed below.

Potential Building Damage

When groundborne vibration encounters a building, vibrational energy is transmitted to the structure, causing it to vibrate, and, if the vibration levels are high enough, damage to the building may occur. Depending on the type of building and the vibration levels, this damage could range from cosmetic architectural damage (e.g., cracked plaster, stucco, or tile) to more severe structural damage (e.g., cracking of floor slabs, foundations, columns, beams, or wells). Buildings can typically withstand higher levels of vibration from transient sources than from continuous or frequent intermittent sources. Transient sources are those that create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment. Older, fragile buildings (which may include important historical buildings) are of particular concern. Modern commercial and industrial buildings can generally withstand much higher vibration levels before potential damage becomes a problem.

Human Disturbance/Annoyance

Groundborne vibration can be annoying to people and can cause serious concern for nearby neighbors of vibration sources, even when vibration is well below levels that could cause physical damage to structures. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernible, but there is less adverse reaction without the effects associated with the shaking of a building. When groundborne vibration waves encounter a building, vibrational energy is transmitted to the structure causing building surfaces (walls, floors, and ceilings) to vibrate. This movement may be felt directly by building occupants and may also generate a low-frequency rumbling noise as sound waves are radiated by the vibrating surfaces. At higher frequencies, building vibration can cause other audible effects such as rattling of windows, building fixtures, or items on shelves or hanging on walls. These audible effects due to groundborne vibration are referred to as *groundborne noise*. Any perceptible effect (vibration or groundborne noise) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping or reading will be more sensitive than someone who is engaged in any type of physical activity.

Vibration-Sensitive Land Uses

Because building damage would be considered a permanent negative effect at any building, regardless of land use, any type of building would typically be considered sensitive to vibration damage impacts. Fragile structures, which often include historical buildings, are most susceptible to damage and are of particular concern.

Land uses that would be considered sensitive to human annoyance caused by vibration are generally the same as those that would be sensitive to noise and would typically include residential dwellings, hotels/motels, hospitals, nursing homes, educational facilities, and libraries. It is noted, however, that vibration effects are typically only considered inside occupied buildings and not at outside areas such as residential yards, parks, or open space.

AMBIENT NOISE LEVELS AND EXISTING NOISE SOURCES

Ambient noise is the background noise level of any location or environment, normally specified to compare it to a new intrusive noise source. Ambient noise includes all sounds present in an environment and can be measured at any moment in time, but it typically varies over time. Ambient noise levels are generally considered low when ambient levels are below 45 dBA CNEL, moderate in the 45 to 65 dBA CNEL range, and high above 65 dBA CNEL.

The existing noise environment in the Plan Area is composed of transportation and non-transportation sources. Transportation sources include roadway vehicle traffic; railroad train operations, including light rail, commuter, and freight trains; and aircraft operations. Generally, transportation-related noise sources (e.g., vehicle traffic noise) characterize the ambient noise environment of an area. Non-transportation, or localized stationary/fixed sources include mechanical equipment, commercial/industrial equipment and operations, construction equipment, and any other sources not associated with the transportation of people or goods. Existing noise exposure associated with these primary noise sources in the San Diego region is presented below.

Vehicle Traffic Noise

The ambient noise environment in the Plan Area is primarily defined by roadway vehicle traffic. The traffic noise level generated on a roadway is dependent on traffic speed, traffic volume, and the relative percentage of medium (2-axle) and heavy (3+ axle) trucks. In general, the greater the traffic volume is on a roadway, the higher the noise levels that are generated on that roadway. This holds true until the traffic volume is so great (i.e., approaching capacity) that traffic flow degrades and traffic speeds decrease as the roadway becomes congested, which lowers traffic noise levels. All else being equal, roadways with larger percentages of trucks (particularly heavy trucks) will generate higher noise levels. A heavy truck traveling 50 mph generates approximately 85 dBA, whereas an automobile traveling the same speed generates only 71 dBA. As a result the heavy truck sounds more than twice as loud as the automobile (an increase of 10 dBA is usually perceived as a "doubling" of sound).

The overall noise level from a vehicle is the combination of multiple subsources. All vehicle types generate noise from the road-tire interaction (i.e., the noise of the tires rolling across the pavement) as well as from the engine and exhaust. In addition heavy trucks often have elevated exhaust stacks (typically around 10 to 11 feet high) that represent an additional source of noise located higher above the roadway than for smaller vehicle types.

Roadways that generate the highest noise levels in the Plan Area are the interstate and state highways as they have the highest speed limits, the largest traffic volumes, and the highest percentage of trucks. Figure 2-1 in Chapter 2, *Project Description,* shows the interstate and state highway network and significant arterials in the Plan Area. Traffic typically generates 70 to 75 dB L_{dn} at 50 to 100 feet from major highways. Heavily used roadways, such as arterials and major streets, also generate significant levels of noise, typically 65 to 70 dB L_{dn} at similar distances (FTA 2018).

Noise from line sources, such as roadways, typically attenuate at a rate of 3 to 4.5 dBA per doubling of distance, depending on the ground conditions (FHWA 2011). Additional attenuation is provided by the presence of natural or human-made barriers or structures. In populated areas, a general rule for estimating noise reductions due to intervening structures is to assume one row of buildings every 100 feet from the roadway and apply a -4.5 dBA reduction in traffic noise levels for the first row and -1.5 dBA for every subsequent row, up to a maximum of -10 dBA attenuation (FTA 2018). Highway traffic noise is not usually a serious problem for people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads (FHWA 2011).

In the San Diego region, there is a wide range of land uses located adjacent to highways and major streets, including residences, schools, churches, hospitals, shopping centers, industrial parks, agriculture, parks, and open space. Of these, residences, schools, churches, and hospitals are typically considered noise sensitive by cities and the County, as defined in the noise elements of their respective general plans.

Rail Noise

Ambient noise levels in the Plan Area are also characterized by noise from rail operations. The two basic types of railroad operations are freight and passenger train operations, the latter consisting of commuter and intercity passenger trains and steel-wheel urban railway transit (i.e., trolley). Generally, freight train operations can occur at all hours of the day and night, while passenger train operations are concentrated within the daytime and evening periods. Train operations are intermittent and rail lines are widely dispersed except for limited locations with a higher concentration of activity such as freight rail/switching yards or transit centers where various railways converge (e.g., at the Santa Fe Depot in downtown San Diego). As a result, large parts of the Plan Area experience little to no rail noise, and it does not contribute substantially to the ambient noise levels in these areas. Nonetheless, train operations generate substantial noise levels in the immediate vicinity of the railways.

The overall noise level from rail lines is the combination of multiple subsources. These include the propulsion systems (typically electric control systems and motors for light rail and rapid transit, and diesel engines for larger locomotives) and their ancillary devices (e.g., cooling fans and gears), and noise generated by the interaction of the wheels and tracks (rolling noise due to continuous rolling contact; impact noise when a wheel encounters a rail joint, turnout, or crossover; and squeal generated by friction on tight curves). For very high-speed railway vehicles, air turbulence can also be a significant source of noise. In addition, the sounding of train air horns and crossing gate bells also contributes to higher noise levels near railway/roadway grade crossings. Other sources of noise associated with rail operations are train stations, maintenance yards and shops, power substations, and switchyards.

Similar to traffic noise, described above, mobile rail noise sources are considered line sources with typical attenuation rates of 3 to 4.5 dBA per doubling of distance, depending on the ground conditions (FHWA 2011), and additional attenuation provided by the presence of natural or human-made barriers or structures. Stationary sources (such as crossing bells) are considered point sources with typical attenuation rates of 6 to 7.5 dBA per doubling of distance, depending on the ground conditions, and additional attenuation provided by the presence of natural or human-made barriers or structures.

Average railway noise levels (L_{dn}) at distances from mainline railway corridors can be estimated based on an average train traffic volume of 5 to 10 trains per day at speeds of 30 to 40 mph from the center of the railway, as shown in Table 4.13-2 (FTA 2018).

Table 4.13-2
Estimating Railway Noise Exposure for General Assessment

Distance from Railway (feet)	Noise Exposure Estimates (Ldn)
10–30	75
30–60	70
60–120	65
120–240	60
240–500	55
500–800	50
800 and up	45

Source: FTA 2018.

In the Plan Area, there is a wide range of land uses (some noise-sensitive) located adjacent to railways, including but not limited to residences, schools, churches, hospitals, shopping centers, industrial parks, agriculture, parks, and open space. The Federal Transit Administration (FTA) provides "screening distances" to estimate where significant noise impacts may occur relative to various rail and other transportation facilities. Some examples are provided in Table 4.13-3 (FTA 2018). It is noted that the presence of sensitive receptors within these screening distances does not mean noise impacts would definitely occur, simply that FTA procedures require additional analysis under these conditions.

Table 4.13-3
Example FTA Screening Distances for Rail and Other Transportation Facility Noise

Type of Project		Screening Distance (feet)	
		Unobstructed	With Intervening Buildings
Commuter Rail Mainline		750	375
Commuter Rail Station	With Horn Blowing	1,600	1,200
	Without Horn Blowing	250	200
Commuter Rail-Highway Crossing with Horns and Bells		1,600	1,200
Rail Rapid Transit (RRT)		700	350
RRT Station		200	100
Light Rail Transit (LRT)		350	175
Streetcar		200	100
Access Roads to Stations		100	50
Low and Intermediate Capacity Transit	Steel Wheel	125	50
	Rubber Tire	90	40
	Monorail	175	70
Yards and Shops		1,000	650
Parking Facilities		125	75
Access Roads to Parking		100	50
Ventilation Shafts		200	100
Power Substations		250	125

Type of Project		Screening Distance (feet)	
		Unobstructed	With Intervening Buildings
Bus Systems			
Busway		500	250
Bus Rapid Transit (BRT) on exclusive roadway		200	100
Bus Facilities	Access Roads	100	50
	Transit Mall	225	150
	Transit Center	225	150
	Storage & Maintenance	350	225
	Park & Ride Lots w/Buses	225	150
Ferry Boat Terminals		300	150

Source: FTA 2018.
[1] Although some of the project types referenced in this table are not directly related to rail projects, the screening distances reflected as part of the FTA Transit Noise and Vibration Impact Assessment Manual may be relevant to other aspects of the proposed Plan.

Aircraft Noise

The Plan Area is also affected by noise from aircraft operations, which generate substantial noise levels in the immediate vicinity of airport runways and approach and departure flight paths. The San Diego region includes the following airports, as shown in Figure 4.9-1 in Section 4.9, *Hazards and Hazardous Materials*:

- **International and domestic airports:** San Diego International Airport (SDIA), Tijuana International Airport (directly across U.S. border with Mexico), and McClellan-Palomar (Carlsbad) Regional Airport.
- **Military airfields:** Naval Air Station (NAS) North Island, Marine Corps Air Station (MCAS) Miramar, MCAS Camp Pendleton, Naval Outlying Landing Field (NOLF) Imperial Beach, and Coast Guard Air Station San Diego.
- **Towered General Aviation airports:** Brown Field, Gillespie Field, Montgomery Field, and Ramona Airport.
- **Non-towered General Aviation airports**: Agua Caliente Airport, Borrego Valley Airport, Fallbrook Community Airpark, Jacumba Airport, Oceanside Municipal Airport, Ocotillo Airport, and Pauma Valley Airport.

In addition to the numerous daily aircraft operations originating and terminating at these facilities, aircraft not utilizing these airports fly over the San Diego region at various altitudes, and contribute to the overall ambient noise environment. The proximity of the noise receptor to the airport and aircraft flight path(s) determines the noise exposure. Other contributing factors include the type of aircraft, type and number of aircraft operations (e.g., takeoffs, landings, flyovers), altitude of the aircraft, and atmospheric conditions, which may alter to the approach and departure direction of aircraft as well as affect aircraft noise propagation.

As discussed in further detail below, State law requires land use commissions to prepare and adopt an airport land use compatibility plan (ALUCP) for each public use and military airport. These plans typically include airport noise contour maps illustrating the average daily noise exposure (measured in dB CNEL) in the airport's vicinity. Copies of the available existing noise contour maps for Plan Area airports are provided in Appendix N. For smaller airports (e.g., Ramona Airport) reported noise levels range from approximately 50 to 65 dB CNEL. Lower noise levels (50 to 55 dB CNEL) may extend several thousand feet from the airport boundaries along dominant flight path(s); while higher noise levels (65 dB CNEL) do not extend much beyond the airport boundaries (SDCRAA 2008). For the

largest airports (e.g., SDIA) reported noise levels range from approximately 60 to 75 dB CNEL. The lower noise levels from major airports (60 to 65 dB CNEL) may extend several miles from the airport boundaries along dominant flight path(s), while higher noise levels (75 dB CNEL) may extend several thousand feet (SDCRAA 2014).

In addition to the public-use or military airports, there are numerous private and special-use airstrips and helipads in the Plan Area, many which are located in the eastern areas of the region or remote vacation destinations. Several private helipads are located on the roofs of hospitals and buildings owned by large corporations or used by police stations. Private airstrips/helipads located within the San Diego region are not required to prepare noise contours because their noise levels are substantially less than airports due to lower activity levels and their use restrictions are much less defined than with public-use airports (SDCRAA 2014).

Construction Noise

Construction activities generate temporary, short-term noise levels. For large transportation projects, the total period of construction can be months or even years; however, these project often have a large linear footprint (e.g. a stretch of freeway or railroad), which means that peak construction activities only occur adjacent to any single receptor for a limited portion of the total duration. Construction noise is of more concern when it takes place near noise-sensitive land uses, or occurs at night or in early morning hours. Construction noise can also affect nearby noise-sensitive special-status wildlife species and habitat by interfering with the ability to establish territory, vocalize, or successfully reproduce. Additional discussion of noise-sensitive special-status wildlife is provided in Section 4.4, *Biological Resources.* Local governments typically regulate noise associated with construction equipment and activities through enforcement of noise ordinance standards, implementation of general plan policies, and imposition of conditions of approval for building or grading permits.

Noise generated from construction equipment varies greatly depending on the construction activity being performed, equipment type, model, age, condition, and usage. High impact construction techniques, such as pile driving, blasting, and crack-and-seat pavement breaking, produce the highest noise levels and typically dominate the local noise environment when they occur; however, these techniques are not required for all construction projects. Outside of high-impact techniques, heavy equipment operation (e.g., earthmoving) typically dominates the noise generated at construction sites. Stationary sources such as generators, pumps, and compressors may also produce substantial continuous noise.

The magnitude of overall construction noise levels depends on the type of construction activity, the schedule of multiple pieces of construction equipment operating simultaneously, the duration of the activity, the distance between the activity and noise-sensitive receptors, and the presence or absence of any noise attenuating features. Table 4.13-4 provides a list of typical construction equipment, their maximum operational noise level (L_{max}) at 50 feet, their typical duty cycles (i.e., percentage operated within a period of time), and the resulting average noise level (L_{eq}) at 50 feet.

Table 4.13-4
Construction Equipment Noise Levels

Equipment	L^{max} at 50 Feet, dBA	Typical Duty Cycle (percent)	L^{eq} at 50 Feet, dBA
Auger Drill Rig	84	20	77
Backhoe	78	40	74
Blasting	94	1	74

Equipment	L^{max} at 50 Feet, dBA	Typical Duty Cycle (percent)	L^{eq} at 50 Feet, dBA
Chain Saw	84	20	77
Clam Shovel	87	20	80
Compactor (ground)	83	20	76
Compressor (air)	78	40	74
Concrete Mixer Truck	79	40	75
Concrete Pump	81	20	74
Concrete Saw	90	20	83
Crane (mobile or stationary)	81	16	73
Dozer	82	40	78
Dump Truck	77	40	73
Excavator	81	40	77
Front End Loader	79	40	75
Generator (25 KVA or less)	81	50	78
Generator (more than 25 KVA)	73	50	70
Grader	85	40	81
Hydra Break Ram	90	10	80
Impact Pile Driver (diesel or drop)	101	20	94
Jackhammer	89	20	82
Mounted Impact Hammer (hoe ram)	90	20	83
Paver	77	50	74
Pneumatic Tools	85	50	82
Pumps	81	50	78
Rock Drill	81	20	74
Scraper	84	40	80
Tractor	84	40	80
Vacuum Excavator (vac-truck)	85	40	81
Vibratory Concrete Mixer	80	20	73
Vibratory Pile Driver	101	20	94

Source: FHWA 2006.
KVA = kilovolt amp

As shown in Table 4.13-4, maximum noise levels generated by typical construction equipment range from approximately 73 to 90 dBA measured at 50 feet (assuming no attenuation from intervening features such as buildings or topography); high impact equipment (pile driving, blasting, and impact hammers) generate higher levels of 90 to 101 dBA at 50 feet (FHWA 2006). The noise levels vary for each type of equipment, as equipment may come in different sizes and with different engines. Construction equipment noise levels also vary as a function of the activity level or duty cycle. In a typical construction project, the loudest short-term noise levels are typically those of earth-moving equipment under full load, which typically range from 85 to 90 dBA at 50 feet from the source.

Noise impacts on sensitive receptors resulting from construction projects would depend on several factors, such as the type of project, land use of the given area, proximity of sensitive receptors, duration of construction activities, and presence or absence of barriers between noise source and receptor. Additionally, construction noise levels would fluctuate depending on construction phase.

Noise levels from construction activities are typically considered point sources with typical attenuation rates of 6 to 7.5 dBA per doubling of distance, depending on the ground conditions, and additional attenuation provided by the presence of natural or human-made barriers or structures. Typically, construction projects involve ground conditions with a mix of acoustically soft and hard surfaces, or surfaces that fall somewhere between the two extremes (such as bare dirt); therefore, the 6 dBA attenuation rate is often conservatively assumed and for construction noise impact analyses.

Commercial, Industrial, and Other Non-Transportation Noise Sources

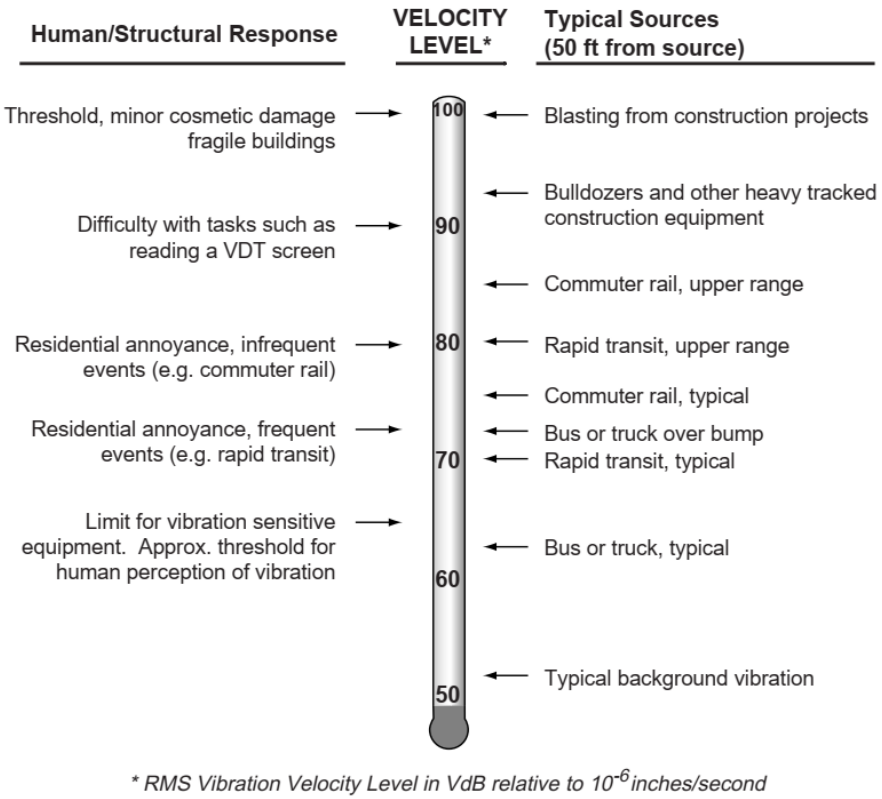
This category of ambient noise sources is extremely varied because it encompasses all the non-transportation noise sources resulting from the multitude of land uses throughout the Plan Area. One major category of noise sources is mechanical equipment, which ranges from small residential heating, ventilation and air conditioning (HVAC) units to large industrial systems with chillers, fans, compressor, cooling towers, etc. General noise sources associated with many different land uses include parking lot noise (e.g., opening and closing of vehicle doors, people talking, car alarms) and delivery activities (e.g., loading docks, use of forklifts, hydraulic lifts). Other noise sources include large machinery associated with industrial, manufacturing, and agricultural operations; municipal/utility operations (landfills, water treatment plants, power stations, etc.); activities at schools, parks, amphitheaters, and athletic facilities; landscape maintenance (leaf blowers and lawnmowers); and operations at port facilities, to name just a few.

While these types of noise sources may be substantial contributors to the local ambient noise levels, their effects are generally localized and do not extend over a large geographical area in the same way as noise from transportation systems.

AMBIENT VIBRATION LEVELS AND EXISTING VIBRATION SOURCES

Background vibration is usually much lower than the threshold of human perception. The ambient vibration velocity level in residential areas is usually 50 VdB or lower, and the threshold of perception for humans is approximately 65 VdB. Low levels of background vibration are usually of concern only when the vibration affects very sensitive manufacturing or research equipment (FTA 2018). Perceptible vibration is typically part of the ambient environment only at locations in proximity to specific notable vibration sources such as uneven roads used by heavy vehicles, rapid transit lines, commuter or freight rail, or heavy industrial operations. Construction activities may also produce perceptible vibration, but these are usually short term rather than part of the permanent ambient environment. Figure 4.13-1 illustrates typical vibration velocity levels experienced by receivers in proximity to various vibration sources.

Figure 4.13-1
Typical Levels of Groundborne Vibration



Source: FTA 2018.

Existing vibration sources in the Plan Area can be classified as transportation and non-transportation sources. Transportation sources include railroad train operations, including light rail, commuter, and freight trains. Non-transportation or localized stationary/fixed sources include construction equipment and heavy industrial machinery. Existing vibration exposure associated with these sources in the San Diego region is presented below.

Train/Rail Vibration

Rail lines, including light rail, rail rapid transit, commuter rail, and freight rail, generate vibration at land uses adjacent to their alignments. Generally, freight train operations can occur at all hours of the day and night, while passenger train operations are concentrated within the daytime and evening periods. Train operations are intermittent, and rail lines are widely dispersed except for limited locations with a higher concentration of activity such as freight rail/switching yards or transit centers where various railways converge (e.g., at the Santa Fe Depot in downtown San Diego). As a result, large parts of the Plan Area experience little to no rail-related groundborne vibration or groundborne noise. Nonetheless, train operations generate substantial vibration levels in the immediate vicinity of the railways.

In the Plan Area, there is a wide range of land uses (some vibration-sensitive) located adjacent to railways. The FTA provides "screening distances" to estimate where significant vibration impacts may occur relative to various rail facilities. Some examples are provided in Table 4.13-5 (FTA 2018). It is noted that the presence of sensitive receptors within these screening distances does not mean vibration impacts would definitely occur, simply that FTA procedures require additional analysis under these conditions.

Table 4.13-5
Example FTA Screening Distances for Rail Vibration

Type of Project	Critical Distance for Land Use Categories1		
	Distance from Right-of-Way or Property Line (feet)		
	Land Use Category 1	Land Use Category 2	Land Use Category 3
Conventional Commuter Railroad	600	200	120
Rail Rapid Transit	600	200	120
Light Rail Transit and Streetcars	450	150	100
Intermediate Capacity Transit	200	100	50
Bus Projects (if not previously screened out)	100	50	--

Source: FTA 2018.
[1] For the Vibration Screening Procedure, evaluate special buildings as follows:
Category 1 – concert halls and TV studios, Category 2 – theaters and auditoriums.
Land Use Category 1: High Sensitivity (e.g., buildings where vibration-sensitive research and manufacturing is conducted, hospitals with vibration-sensitive equipment, and universities conducting physical research operations).
Land Use Category 2: Residential (e.g., all residential land use and buildings where people normally sleep, such as hotels and hospitals).
Land Use Category 3: Institutional (e.g., institutions and offices that have vibration-sensitive equipment and have the potential for activity interference such as schools, churches, and doctors' offices).

Construction Vibration

Construction activities generate temporary, short-term vibration levels. For large transportation projects, the total period of construction can be months or even years; however, these projects often have a large linear footprint (e.g., a stretch of freeway or railroad), which means that peak construction activities only occur adjacent to any single receptor for a limited portion of the total duration. Construction vibration is of more concern when it takes place near sensitive buildings, or occurs at night or in early morning hours.

Vibration generated from construction equipment varies greatly depending on the construction activity being performed and the equipment being used. High impact construction techniques, such as pile driving, blasting, and crack-and-seat pavement breaking, produce the highest vibration levels and typically dominate the local vibration environment when they occur; however, these techniques are not required for all construction projects. Outside of high-impact techniques, heavy equipment operation (e.g., earthmoving) typically dominates the vibration generated at construction sites.

Because vibration impacts are assessed based on short-term metrics, such as the 1-second RMS vibration velocity level or the instantaneous PPV, the magnitude of the worst case vibration level at any given receiver is typically dominated by the single most vibration-intensive task while it occurs closest to the individual receiver.

Table 4.13-6 provides a list of typical construction equipment, the associated PPV (in/s) at a reference distance of 25 feet, and the estimated distances to different levels of human response.

Table 4.13-6
Construction Equipment Vibration Levels (PPV)

Equipment Item	Reference PPV at 25 feet (in/s)	Distance to Human Response (feet)[1]			
		Barely Perceptible	Distinctly Perceptible	Strongly Perceptible	Severe
Crack-and-Seat Operations	2.4[2]	3,646	1,034	450	128
Impact Pile Driver	0.65[2]	1,112	316	138	39
Vibratory Pile Driver	0.65[2]	1,112	316	138	39
Hydraulic Breaker	0.24[2]	450	128	56	16
Vibratory Roller	0.21[3]	399	113	50	14
Large Bulldozer	0.089[3]	183	52	23	7
Caisson Drilling	0.089[3]	183	52	23	7
Jackhammer	0.035[3]	79	23	10	3
Small Bulldozer	0.003[3]	9	3	2	1

[1] Caltrans 2020
[2] FTA 2018
Note: Distances are calculated using the Reference PPV (PPV_{ref}) at 25 feet. The equation used to calculate these distances is $PPV = PPV_{ref} * (25/D)^{1.1}$, as referenced in Caltrans 2020.

Commercial, Industrial, and Other Non-Transportation Vibration Sources

Outside of the transportation and construction sources described above, there are few vibration sources that would affect the perceptible ambient conditions at sensitive receptors. Perceptible vibration from mechanical equipment and industrial machinery is primarily limited to the structures in which it occurs because it does not generate enough vibrational energy to propagate large distances. In addition, vibrating equipment is often treated at the source (for instance with vibration-damping mounts) specifically to minimize vibration transfer. Finally, local zoning and land use planning tend to protect against placing vibration-sensitive receivers in proximity to major industrial operations.

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

No studies were found that investigate the impacts of climate change on noise and vibration.

4.13.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Some federal regulations provide specific quantitative noise limits (such as maximum permissible noise levels for specific vehicle types), while others provide requirements and guidance for noise-related programs to be prepared by others (such as requirements for noise contour maps and noise compatibility programs for public use airports). Key federal regulations are briefly described below.

FAA, FHWA, and EPA

Aircraft Noise Regulations

14 Code of Federal Regulations (CFR) 36 is published by the Federal Aviation Authority (FAA) and establishes maximum acceptable noise levels for various specific aircraft types, taking into account the model year, aircraft weight, and number of engines.

Airport Noise Compatibility Planning

14 CFR 150 is published by the FAA and prescribes the procedures, standards, and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs for public use airports (including heliports). The Part 150 program (Airport Noise Compatibility Planning) proposes measures to reduce the land use incompatibility. Under the program, airport projects such as land acquisition and acoustic treatment of residences, become eligible for federal funding. The Part 150 program establishes a voluntary program that airports can utilize to conduct airport noise compatibility planning, and the program also prescribes a system for measuring airport noise impacts and presents guidelines for identifying incompatible land uses. Part 150 noise exposure maps are depicted with annual average DNL contours around an airport. DNL is equivalent to L_{dn}, and similar to CNEL, as discussed in Section 4.13.1, *Existing Conditions*; FAA accepts California's use of CNEL.

Part 150 considers all land uses with noise levels less than 65 DNL to be compatible with aircraft operations. At higher noise exposures, selected land uses are also deemed acceptable, depending upon the nature of the use and the degree of structural noise attenuation provided. However, these designations do not constitute a federal determination that any use of land covered by the Part 150 program is acceptable or unacceptable under federal, state, or local law; the responsibility for determining the acceptable and permissible land uses and the relationship with specific noise contours rests with the local authorities.

Traffic Noise Impacts

23 CFR 772 is published by the FHWA and is the federal regulation governing traffic noise impacts. A federal or federally funded project would have a traffic noise impact if the project involved the construction of a new highway, or the significant modification of an existing freeway (a "Type I"[1] project), where the project would result

[1] Type I projects include:

1. The construction of a highway on new location; or
2. The physical alteration of an existing highway where there is either:
   a. Substantial Horizontal Alteration.; or
   b. Substantial Vertical Alteration; or
3. The addition of a through-traffic lane(s) including the addition of a through-traffic lane that functions as a High-Occupancy Vehicle (HOV) lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane; or
4. The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or
5. The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or
6. Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or

in a substantial operational noise increase, or when the predicted operational noise levels approach or exceed the FHWA Noise Abatement Criteria (NAC). A "substantial increase" is not specifically defined by FHWA, but is indicated to be in the range of 5 to 15 dBA. Specific increase criteria are defined by the state transportation agency. FHWA has developed NAC for activity categories at various noise-sensitive land uses as summarized in Table 4.13-7. Noise levels that "approach" the NAC are defined as 1 dBA less than the criterion level (i.e., 66 dBA L_{eq} for Activity Category B land uses).

Table 4.13-7
FHWA Noise Abatement Criteria[1]

Activity Category	Activity $L_{eq(h)}$	Criteria $L_{10(h)}$ [2]	Evaluation Location	Description of Activities
A[3]	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	67	70	Exterior	Residential
C	67	70	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D[3]	52	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F.
F	--	--		Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship-yards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--		Undeveloped lands that are not permitted.

Source: 23 CFR Part 772.
[1] Hourly A-Weighted Sound Levels Decibels (dBA); either $L_{eq(h)}$ or $L_{10(h)}$ (but not both) may be used on a project.
[2] The $L_{eq(h)}$ and $L_{10(h)}$ Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
[3] Includes undeveloped lands permitted for this activity category.

It is noted that, since 2007, Caltrans has performed federal responsibilities for NEPA compliance for highway projects in California that are funded by FHWA. This legal arrangement, referred to as NEPA Assignment, eliminates FHWA's project-specific review and approval. In reviewing and approving projects under NEPA,

7. The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot, or toll plaza.

Caltrans is responsible for complying with all applicable federal environmental laws and with FHWA NEPA regulations, policies, and guidance, such as traffic noise regulations.

Noise Emission Standards for Rail

These two parts of the code are closely interrelated. 40 CFR 201 is published by the Environmental Protection Agency (EPA) and establishes noise emission standards for transportation equipment used by interstate rail carriers. Equipment covered by the regulation includes locomotives (under both operation stationary and moving conditions), rail cars, retarders, car coupling operations, and locomotive load cell tests. 49 CFR 210 is published by the Federal Railroad Administration (FRA) and prescribes minimum compliance regulations for enforcement of 40 CFR 201.

Noise Emission Standards for Trucks and Motorcycles

40 CFR 205 is also published by the EPA and establishes noise emission standards for medium and heavy duty trucks, motorcycles, and motorcycle exhaust systems.

Federal Transit Administration and Federal Railroad Administration

FTA has prepared a guidance manual (FTA 2018) that presents procedures for predicting and assessing noise and vibration impacts of proposed mass transit projects. The FTA manual was originally published in 1995 and subsequently updated in 2006 and again in 2018. All types of bus and rail projects are covered. This establishes the FTA's methodology for addressing potential noise impacts under NEPA and 23 CFR 771, and is generally required for federal or federally funded transit projects (analysis is not required for projects classified as categorical exclusions). FRA has adopted the FTA methodologies and significance criteria for its own guidance manual (FRA 2012) for predicting and assessing noise and vibration impacts of proposed high-speed ground transportation projects (including high-speed trains using traditional steel-wheel on steel-rail technology as well as magnetically levitated [maglev] systems). The FRA manual was originally published in 1998 and subsequently updated in 2012.

FTA and FRA noise impact thresholds are based on a project's incremental noise increase relative to existing noise conditions. Project noise levels are divided into three categories (no impact, moderate impact, and severe impact) as illustrated in Figure 4.13-2. While higher project noise levels are permitted in areas with higher existing ambient conditions, the thresholds are designed to limit the total noise increase, with the smallest allowable increase at locations already affected by the highest existing noise levels.

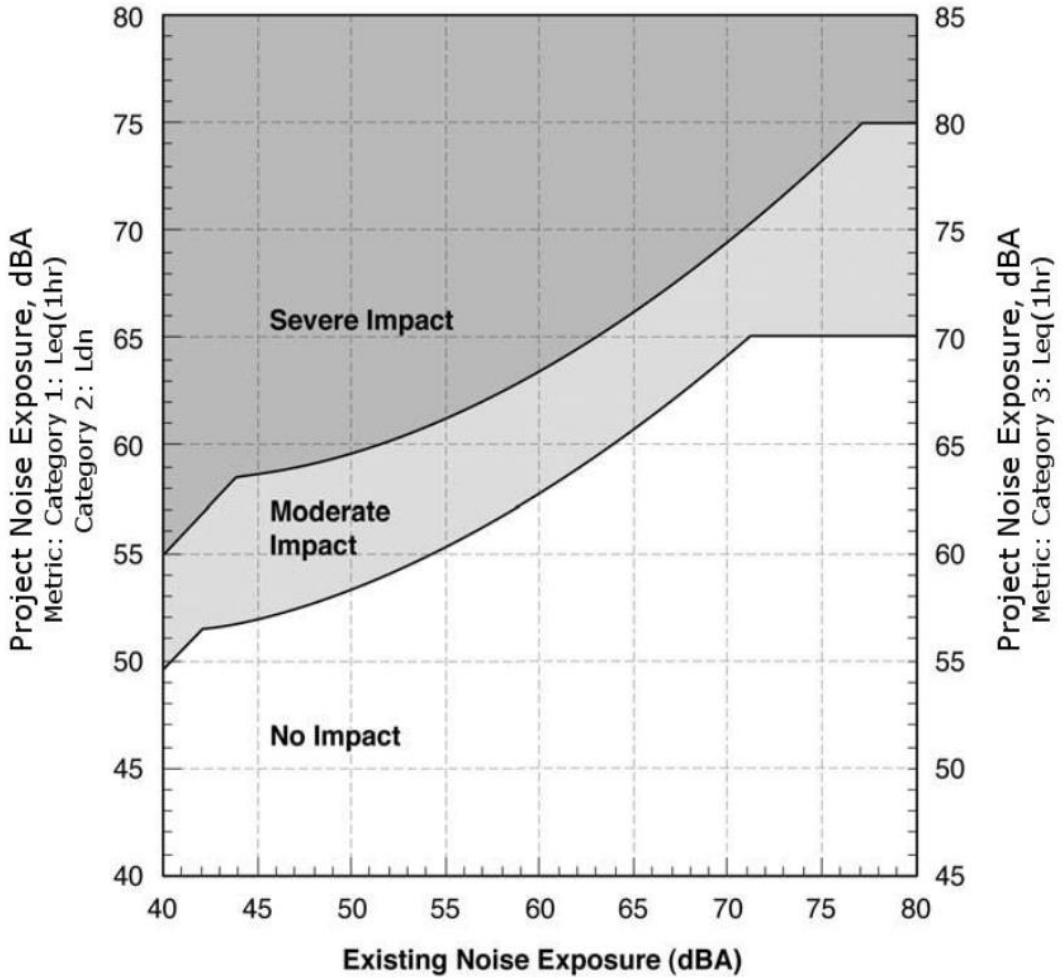
Construction Noise

According to the FTA manual, "[p]roject construction noise criteria should take into account the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use". While FTA does not specify standardized criteria for construction noise impacts, it provides varying guidelines to be considered on a case-by-case basis depending, in part, on the level of detail available regarding the anticipated construction activities and schedule. Additionally, FTA considers a 10 dBA increase in high ambient noise levels (L_{dn} greater than 65 dB) to be a substantial temporary increase in noise levels. FTA does not provide guidance for a temporary substantial increase in noise levels in quieter areas.

Groundborne Noise and Vibration

The FTA manual also provides groundborne noise and vibration criteria for both project operations and construction. For operational vibration, the criteria are based on the potential for human annoyance and activity interference. The general criteria are summarized in Table 4.13-8.

Figure 4.13-2
FTA Noise Impact Criteria for Noise-Sensitive Uses (dBA)



Source: FTA 2018.

Land Use Category 1: Tracts of land where quiet is an essential element in their intended purposes. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor uses. Also included are recording studios and concert halls. The noise metric for Category 1 is the outdoor 1-hour L_{eq} during the noisiest hour of activity.

Land Use Category 2: Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed of utmost importance. The noise metric for Category 2 is the outdoor L_{eq} or CNEL.

Land Use Category 3: Institutional land uses with primarily daytime and evening uses. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities can also be considered in this category. Certain historical sites and parks are also included. The noise metric for Category 3 is the outdoor 1-hour L_{eq} during the noisiest hour of activity.

Table 4.13-8
Groundborne Vibration and Groundborne Noise Impact Criteria for FTA General Assessment

Land Use Category	Groundborne Vibration Impact Levels			Groundborne Noise Impact Levels		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB4	65 VdB4	65 VdB4	N/A5	N/A5	N/A5
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: FTA 2018.
[1] "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
[2]"Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
[3] "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
[5] Vibration-sensitive equipment is generally not sensitive to ground-borne noise.

Additional criteria are provided for various types of special buildings such as concert halls, TV studios, recording studios, auditoriums, and theaters.

For vibration generated by construction, two types of potential impact are addressed: human annoyance and structural damage. Human annoyance from construction is assessed using the same general criteria discussed above for operational sources. FTA criteria for potential building damage are summarized in Table 4.13-9.

Table 4.13-9
FTA Construction Vibration Damage Criteria

Building Category	PPV (in/s)
I. Reinforced-concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

Source: FTA 2018.

Department of Defense Instruction 4165.57

Department of Defense Instruction 4165.57 establishes policy, assigns responsibilities, and prescribes procedures for the DoD Air Installations Compatible Use Zones (AICUZs) program for military air installations. It also establishes policy and assigns responsibility for educating air installation personnel and engaging local communities on issues related to noise, safety, and compatible land use in and around air installations, and

prescribes procedures for plotting noise contours for land use compatibility analysis. The noise compatibility criteria are basically the same as those indicated by the FAA in 14 CFR 150. As a result, AICUZ compatibility standards identify residential land uses as being compatible with aircraft noise levels of up to 65 dB CNEL.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

California State Aeronautics Act

The California State Aeronautics Act (SAA), pursuant to Public Utilities Code (PUC), Section 21001 et seq., was established "to protect the public interest in aeronautics and aeronautical progress." Airport land use compatibility planning, as required by the SAA, outlines the statutory requirements for Airport Land Use Commissions (ALUCs) including the preparation of ALUCPs for each public use airport in California. Caltrans' Division of Aeronautics administers much of the SAA and provides guidance for meeting the baseline safety and compatibility requirements.

Airport Land Use Compatibility Plans

The State requires that the San Diego County Regional Airport Authority (SDCRAA), as the ALUC, prepare ALUCPs for each public-use and military airport in San Diego County, as directed in PUC Section 21675. An ALUCP contains policies and criteria that address compatibility between airports and future land uses that surround them by addressing noise, overflight, safety, and airspace protection concerns to minimize the public's exposure to excessive noise and safety hazards within the airport influence area for each airport over a 20-year horizon.

ALUCPs include airport runway noise level contours typically in 5 dB increments between 50 and 75 dB CNEL (the range varies depending on the size of the airport). These noise contours reflect the existing and anticipated growth of the airport for at least the next 20 years and include potential development planning. ALUCPs provide noise compatibility criteria, typically in the form of a table or matrix that lists various different land uses and categorizes their compatibility across a range of different noise levels in 5 dB increments. The acceptability of each land use is to each 5-dB noise range is categorized as either "compatible," "conditionally compatible," or "incompatible."

Noise Insulation Standards

The California Noise Insulation Standards in Title 24 of the California Code of Regulations (CCR) set requirements for new residential units, hotels, and motels that may be subject to relatively high levels of transportation-related noise. For areas with exterior noise levels greater than 60 dBA, the noise insulation standard is 45 dBA in any habitable room; an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard is required where such units are proposed in such areas. 24 CCR Part 2, Section 1207.11.2 states, "[t]he noise metric must be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan."

California Department of Transportation

Caltrans manages California's highways and freeways, provides intercity rail services, and permits public-use airports and special-use hospital heliports. Caltrans has programs and divisions with policies or regulations—including Aeronautics, Highway Transportation, Rail, and Mass Transportation. Caltrans Division of Rail uses FRA and FTA noise criteria and methodologies for assessing rail-related noise or vibration impacts. The Caltrans Division of Aeronautics is responsible for licensing and permitting programs for airports and heliports. Assistance for the development and maintenance of aviation facilities through engineering and aviation experience is also provided, as well as systems planning and environmental and community service programs. Caltrans provides

numerous noise and vibration impact guidance documents for traffic noise, rail noise, airport noise, construction noise, and vibration, including the following.

- *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (TeNS Manual) (2013a).
- *Traffic Noise Analysis Protocol (Protocol) for New Highway Construction, Reconstruction, and Retrofit Barrier Projects* (2011b).
- C*alifornia Airport Land Use Planning Handbook.* Division of Aeronautics (2011a).
- *Transportation and Construction Vibration Guidance Manual* (2013b).

Traffic Noise Guidance

As described previously, Caltrans is responsible for implementing 23 CFR 772 for federal or federally funded highway projects under NEPA Assignment. Therefore, Caltrans Protocol uses the same NAC as presented in 23 CFR 772 and provides further details on the policies and procedures to be used in conducting applicable traffic noise studies in California. Traffic noise impacts as defined occur when the predicted noise level in the design year approaches or exceeds the NAC, or a predicted noise level substantially exceeds the existing noise level (a "substantial" noise increase). In California, a substantial noise increase for these projects is considered to occur when the project's predicted worst-hour design-year traffic noise level exceeds the existing worst-hour traffic noise level by 12 dBA or more. The use of 12 dB was established in California many years ago and is based on the concept that a 10 dB increase generally is perceived as a doubling of loudness. A collective decision by Caltrans staff, which was approved by FHWA, was made to use 12 dB (Caltrans 2011b).

According to the Protocol, significance of noise impacts for Caltrans' CEQA documents (e.g., for projects that are subject to Caltrans oversight but are not subject to NEPA because there is no federal funding) is based on the project-related increase in noise and other project-specific conditions (but not the NAC). No single numerical threshold is used on all projects, and the project threshold is developed by the project team on a case-by-case basis. The Caltrans definition for a substantial increase in noise (i.e., a 12 dB increase between existing and design-year with-project conditions) has been used, but there would be cases where an increase less than 12 dB would approach significance (such as a quiet rural environment) or where a 12 dB increase would not necessarily be deemed significant (noisy urban environment) (Caltrans 2011b).

Construction Noise

As presented in the Protocol, Section 14-8.02, Noise Control of Caltrans Standard Specifications establishes a construction noise exposure/production limit of 86 dB L_{max} at 50 feet from job site from 9 p.m. to 6 a.m.

Airport Noise Guidance

Caltrans Division of Aeronautics prepared the *California Airport Land Use Planning Handbook* (Handbook), which provides guidance for conducting airport land use compatibility planning, most notably for the preparation, adoption, and amendment of an ALUCP (Caltrans 2011a). The Handbook provides a checklist of typical ALUCP contents, which includes scope of the ALUCP, airport information, compatibility policies and criteria, compatibility zone maps (including CNEL contours), review policies, preliminary review of plans and projects, land use information, compatibility issues, local government implementation, and supporting materials (Caltrans 2011a).

Vibration

Caltrans provides guidelines for the analysis of groundborne vibration relating to transportation and construction-induced vibration, including guideline criteria for potential building damage and human annoyance, as shown in Tables 4.13-10 and 4.13-11.

Table 4.13-10
Caltrans Guideline Vibration Building Damage Criteria

Structure and Condition	Maximum PPV (in/s)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans 2013b.
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 4.13-11
Caltrans Guideline Vibration Human Annoyance Criteria

Human Response	Maximum PPV (in/s)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Source: Caltrans 2013b.
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

General Plan Guidelines

The Governor's Office of Planning and Research (OPR) is required to adopt and periodically revise guidelines for the preparation and content of local general plans. The 2017 OPR General Plan Guidelines include noise/land use compatibility guidelines, which are shown in Table 4.13-12.

Table 4.13-12
OPR Noise/Land Use Compatibility Guidelines

Land Use Category	Community Noise Exposure, L_{dn} or CNEL, dB													
		55		60		65		70		75		80		
Residential – Low Density Single Family, Duplex, Mobile Homes														
Residential – Multifamily														
Transient Lodging – Motels, Hotels														
Schools, Libraries, Churches, Hospitals, Nursing Homes														
Auditoriums, Concert Halls, Amphitheaters														
Sports Arena, Outdoor Spectator Sports														
Playgrounds, Neighborhood Parks														
Golf Courses, Riding Stables, Water Recreation, Cemeteries														
Office Buildings, Business Commercial and Professional														

Land Use Category	Community Noise Exposure, L_{dn} or CNEL, dB													
		55		60		65		70		75		80		
Industrial, Manufacturing, Utilities, Agriculture														

	Normally Acceptable		Conditionally Acceptable		Normally Unacceptable		Clearly Unacceptable
Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.		New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.		New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.		New construction or development should generally not be undertaken.	

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

General Plan Noise Elements

Local jurisdictions (cities and the County of San Diego) within the Plan Area adopt a noise element as part of their General Plan to identify, appraise, and remedy noise problems in local communities. Noise elements analyze and quantify current and projected noise levels associated with local noise sources, including, but not limited to, highways and freeways, primary arterials and major local streets, rail operations, air traffic associated with the airports, local industrial plants, and other ground stationary sources that contribute to the community noise environment. Beyond statutory federal standards, local jurisdictions may adopt their own noise goals and policies in their noise elements, or adopt noise/land use compatibility guidelines similar to, or the same as, those recommended by the State of California (OPR) (see Table 4.13-12). With the exception of two cities, Del Mar and Oceanside, all other jurisdictions in the region have adopted similar guidelines. The cities of Del Mar and Oceanside consider 65 dB CNEL as the maximum noise level compatible with residential land uses (City of Del Mar 1985, City of Oceanside 2002). For the purposes of assessing noise impacts, standards in the Noise Element are most commonly applied to transportation noise sources. The assessment of non-transportation noise levels is typically based on standards provided in the municipal code.

Local Noise/Vibration Ordinances/Municipal Code

In addition to noise element policies of general plans, local jurisdictions regulate noise through enforcement of their noise ordinances, which are typically contained in the municipal code. The municipal code standards are not applicable to transportation noise sources (roadways, railroads, etc.), but rather are used to control noise from stationary (i.e., non-transportation) sources such as commercial and industrial facilities by setting noise level limits. In addition, most noise ordinances provide separate standards to control noise from construction activities; these are usually a combination of noise levels limits and/or restrictions on the hours during which construction is permitted. Table 4.13-13 and Table 4.13-14 summarize the municipal noise level limits and the construction noise regulations, respectively, for each jurisdiction within the San Diego region. Some local jurisdictions also have regulations related to vibration, as summarized in Table 4.13-15.

Table 4.13-13
Summary of Applicable Property Line Noise Level Limits

Jurisdiction	General Land Use Zone								
	Residential			Commercial			Industrial		
	Daytime	Evening	Nighttime	Daytime	Evening	Nighttime	Daytime	Evening	Nighttime
Carlsbad	--	--	--	--	--	--	--	--	--
Chula Vista	55	55	45	65	65	60	70/80[1]	70/80[1]	70/80[1]
Coronado	50–55	45–50	40–45	60	60	50	--		--
Del Mar	50	50	40	60	60	50	60[2]	60[2]	50[2]
El Cajon	60	55	50	65	60	55	75	75	75
Encinitas	50–55	50–55	45–50	60	60	55	60	60	55
Escondido	50–55	50–55	45–50	60	60	55	70–75[1]	70–75[1]	70–75[1]
Imperial Beach[3]	--		--	--		--	--		--
La Mesa	60	55	50–55	65	65	60	70	70	70
Lemon Grove	50–60	45–55	40–50	60	55	55	70	70	70
National City	55–60	55–60	45–50	65	65	60	70–80[1]	70–80[1]	70–80[1]
Oceanside	50–55	50–55	45–50	65	65	60	70	70	65
Poway	50–55	50	40–45	60	55	55	70	70	70
San Diego, City	50–60	45–55	40–50	65	60	60	75	75	75
San Diego, County	50–55	50–55	45–50	60	60	55	70–75	70–75	70–75
San Marcos	--	--	--	--	--	--	--	--	--
Santee	50–55	45–50	40–45	60	55	50	70–75	70–75	70–75
Solana Beach	50–55	50–55	45	60	60	55	70	70	60
Vista	50–55	50–55	45–50	60	60	55	70	70	70

Source: City of Carlsbad 2021, City of Chula Vista 2021, City of Coronado 2021, City of Del Mar 2021, City of El Cajon 2021, City of Encinitas 2021, City of Escondido 2021, City of Imperial Beach 2021, City of La Mesa 2021, City of Lemon Grove 2021, City of National City 2021, City of Oceanside 2021, City of Poway 2021, City of San Diego 2021, County of San Diego 2021, City of San Marcos 2021, City of Santee 2021, City of Vista 2021.
--no sound level limits
[1] Light industry/heavy industry
[2] Railroad right-of-way zone
[3] The City of Imperial Beach noise ordinance does not contain quantifiable noise level limits at property lines but regulates noise based on disturbance of "the peace, quiet and comfort of the community by creating unreasonably loud or disturbing unnecessary noises."

Table 4.13-14
Summary of Local Construction Noise Standards

Jurisdiction	Municipal Code	Construction Hours Prohibited	Construction Noise Level Limits
Carlsbad	8.48	After 6 p.m. any day; before 7:00 a.m. weekdays; before 8:00 a.m. Saturday; Sundays; federal holidays.	None
Chula Vista	17.24	10:00 p.m.–7:00 a.m., Monday through Friday, and 10:00 p.m. and 8:00 a.m. Saturday and Sunday.	None
Coronado	41.10	7:00 p.m.–7:00 a.m. Monday through Saturday; Sundays; legal holidays	75 dBA L_{eq}
Del Mar	9.20	7:00 p.m.–7:00 a.m., Monday through Friday, and before 9:00 a.m. or after 7:00 p.m. Saturdays; Sundays; City holidays	75 dBA L_{eq} at residential properties
El Cajon	17.115	7:00 p.m.–7:00 a.m., within 500 feet of residential uses	None
Encinitas	9.32	7:00 p.m.–7:00 a.m. Monday through Saturdays; Sundays; federal holidays	75 dBA $L_{eq(8)}$ at residential properties
Escondido	17-234	6:00 p.m.–7:00 a.m., Monday through Friday, before 9:00 a.m. or after 5:00 p.m. Saturdays; Sundays; legal holidays	75 dBA L_{eq} at residential properties
Imperial Beach	9.32	10:00 p.m.–7:00 a.m.	Noises disturbing to the comfort and repose of any person residing or working in the vicinity, or 75 dBA 10 p.m.–7 a.m.
La Mesa	10.80	10:00 p.m.–7:00 a.m. Monday through Saturday; Sundays	None
Lemon Grove	9.24	7:00 p.m.–7:00 a.m. Monday through Saturday; Sundays; legal holidays	75 dBA $L_{eq(8)}$ at residential properties
National City	12.10	7:00 p.m.–7:00 a.m. weekdays; weekends; holidays	60–75 dBA at residential properties, 70-85 dBA at semi-residential/commercial properties
Oceanside	38.15	Case-by-case basis	Case-by-case basis
Poway	8.08	5:00 p.m.–7:00 a.m. Monday through Saturday; Sundays; federal holidays	75 dBA $L_{eq(8)}$ at residential properties
San Diego, City	59.5	7:00 p.m.–7:00 a.m. Monday through Saturday; Sundays; certain legal holidays	75 dBA L_{eq} at residential properties
San Diego, County	36.40	7:00 p.m.–7:00 a.m. Monday through Saturday; Sundays; legal holidays	75 dBA $L_{eq(8)}$ at residential properties
San Marcos	10.24	6:00 p.m.–7:00 a.m. Monday through Friday, before 8:00 a.m. or after 5:00 p.m. Saturdays; Sundays	None
Santee	5.04.090	7:00 p.m.–7:00 a.m. Monday through Saturday; Sunday; holidays	None

Jurisdiction	Municipal Code	Construction Hours Prohibited	Construction Noise Level Limits
Solana Beach	7.34	7:00 p.m.–7:00 a.m. weekdays; 7:00 p.m.-8:00 a.m. Saturday; Sundays; nine holidays	75 dBA $L_{eq(8)}$ at residential properties
Vista	NA	None	None

Source: City of Carlsbad 2021, City of Chula Vista 2021, City of Coronado 2021, City of Del Mar 2021, City of El Cajon 2021, City of Encinitas 2021, City of Escondido 2021, City of Imperial Beach 2021, City of La Mesa 2021, City of Lemon Grove 2021, City of National City 2021, City of Oceanside 2021, City of Poway 2021, City of San Diego 2021, County of San Diego 2021, City of San Marcos 2021, City of Santee 2021, City of Vista 2021. Dates shown are publication dates.

Table 4.13-15
Summary of Local Vibration Standards

Jurisdiction	Municipal Code	Vibration Regulation
Carlsbad	21.34.090	All industrial uses shall comply with the following performance standards: All uses shall be so operated as not to generate vibration discernible without instruments by the average person while on or beyond the lot upon which the source is located or within an adjoining enclosed space if more than one establishment occupies a structure. Vibration caused by motor vehicles, trains and temporary construction is exempted from this standard.
Chula Vista	19.66.080	No vibration, other than from transportation facilities or temporary construction work, shall be permitted which is discernible without instruments at the points of measurement specified in CVMC 19.66.060(A).
El Cajon	17.115	Every use shall be so operated that the ground vibration generated by such use is not harmful or injurious to the use or development of surrounding properties. No vibration shall be permitted which is perceptible without instruments at any use along the property line on which such use is located. For the purpose of this determination, the boundary of any lease agreement or operating unit or properties operating as a unit shall be considered the same as the property line.
Encinitas	30.40.010	Every use shall be so operated that the ground vibration generated at any time and measured at any point along the lot line of the lot on which the use is located shall not be perceptible and shall not exceed the vibration levels set forth in the regulation.
Lemon Grove	17.24.080	Vibrations. No detectable vibrations shall be permitted off the development site.
National City	12.10.180	The vibration perception threshold (motion velocity of 0.01 in/sec over the range of one to one hundred HZ) at or beyond the property boundary of the source on private property, or at a distance of 150 feet from the source if originating from a public space or ROW.
San Marcos	20.300.070	Vibration. Vibration may disturb the conduct of certain activities and create discomfort for some individuals. To minimize the disturbance and inconvenience from vibrations, no person or use shall create, maintain, or cause ground vibration that is discernible without instruments to a person of normal sensitivity at any point on a property that is adjacent to the property of the vibration source. The ground vibration caused by moving vehicles, trains, aircraft, or temporary construction or demolition is exempted.
Santee	13.30.030	Vibration. No operation or activity is permitted which will create vibration noticeable without instruments at the perimeter of the subject property

Source: City of Carlsbad 2021, City of Chula Vista 2021, City of El Cajon 2021, City of Encinitas 2021, City of Lemon Grove 2021, City of National City 2021, City of San Marcos 2021, City of Santee 2021. Dates shown are publication dates.

San Diego County Regional Airport Authority

In the San Diego region, the relationships of transportation, transit, and mobility, and of population growth to noise associated with aircraft in flight are the responsibility of the SDCRAA, established under State law to protect the safety and welfare of the general public and the ability of airports to operate now and in the future (SDCRAA 2014). One of SDCRAA's responsibilities is to serve as the ALUC for San Diego County. The SDCRAA is charged with creating, adopting, or updating ALUCPs for the region's 16 public-use and

military airports in accordance with applicable State and federal laws. SDCRAA has adopted ALUCPs for 16 public-use or military airports in the San Diego region (SDIA 2021), including the following (with year of latest update):

- Agua Caliente Airport (2011)
- Borrego Valley Airport (2011)
- Brown Field (2010)
- Fallbrook Community Airpark (2011)
- Gillespie Field (2010)
- Jacumba Airport (2011)
- MCAS Camp Pendleton (2008)
- MCAS Miramar (2011)
- McClellan-Palomar Airport (2011)
- Montgomery Field (2010)
- Naval Air Station North Island (2020)
- Naval Outlying Landing Field - Imperial Beach (2015)
- Oceanside Municipal Airport (2010)
- Ocotillo Airport (2011)
- Ramona Airport (2011)
- SDIA – Lindbergh Field (2014)

The other remaining airports in the San Diego region include Tijuana International Airport (under the authority of Mexico), Coast Guard Air Station San Diego (military airfield), and Pauma Valley Airport (private airfield), which are not required to prepare an ALUCP.

The adopted ALUCPs of public-use airports in the San Diego region include an analysis of the existing and future aircraft noise level contours to assist local agencies in developing land use plans for areas surrounding the airports. ALUCPs differentiate allowed and prohibited land uses according to noise and land use compatibility guidelines. AICUZ studies also include contour maps, which are included in the noise element of general plans of each jurisdiction affected by public use and military airports, and are considered in the development of land use plans at the local level.

4.13.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for evaluating the significance of a project's environmental impacts on noise, in the form of Initial Study checklist questions. The significance criteria specifically developed for this EIR are based on the Appendix G checklist questions provided from the updates to the CEQA Guidelines (OPR 2018), with modifications. For the purposes of this EIR, the proposed Plan would have a significant noise impact if it would result in:

NOI-1 Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or

noise ordinance, or applicable standards of other agencies; or generate a substantial absolute increase in ambient noise.

NOI-2 Generation of excessive groundborne vibration or groundborne noise levels.

NOI-3 For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would expose people residing or working in the project area to excessive noise levels.

4.13.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

NOI-1 GENERATION OF A SUBSTANTIAL TEMPORARY OR PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE VICINITY OF THE PROJECT IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE, OR APPLICABLE STANDARDS OF OTHER AGENCIES; OR GENERATE A SUBSTANTIAL ABSOLUTE INCREASE IN AMBIENT NOISE

ANALYSIS METHODOLOGY

This section discusses the construction and operation noise impacts of forecasted regional growth and land use change, and planned transportation network improvements in comparison to the applicable noise standards and guidelines from city and county general plans (i.e., noise elements) and noise ordinances, or federal or State agencies (e.g., FTA and Caltrans). Noise impacts (NOI-1) are considered significant if they substantially increase ambient noise levels and exceed the applicable established noise standards required based on the type of project (e.g., local development, transit, highway projects, etc.).

Local construction and operational noise standards, determined at the project level, may apply to regional growth and land use change, as well as local transportation network improvements. As outlined under *Regional and Local Laws, Regulations, Plans, and Policies*, these local standards are typically supplied by the local noise element (noise/land use compatibility) for transportation noise, and the noise ordinance (municipal code) for non-transportation noise sources including construction. For noise and land use compatibility, the County of San Diego and all cities in the San Diego region, except for Del Mar and Oceanside, have adopted the OPR 2017 noise/land use compatibility guidelines as their land use compatibility noise standards, including 60 dB CNEL established as the "normally acceptable" noise level for residential uses. The cities of Del Mar and Oceanside have adopted 65 dB CNEL as the maximum noise level compatible with residential land uses (City of Del Mar 1985, City of Oceanside 2002). For construction and operational noise that would cause potential temporary or permanent increases in ambient noise levels at nearby sensitive receptors, local jurisdictions do not typically provide impact thresholds based solely on the magnitude of a temporary absolute increase in noise levels. Rather, the noise levels are considered substantial when they exceed the applicable regulatory standard.

For certain specific project types, thresholds based on local standards are replaced by thresholds based on the requirements or guidelines of other (regional, State, or federal) agencies:

- Caltrans/FHWA traffic noise criteria (NAC and substantial noise increases) for federal or federally funded highway project.
- Caltrans CEQA-only substantial noise increase standards for state highway projects, or local roadway projects with Caltrans oversight, that are not subject to NEPA.
- Caltrans construction noise criteria and specifications.

- FTA/FRA criteria (for construction and operational noise) for federal or federally funded rail, high speed rail, and other transit projects.
- ALUCP or AICUZ criteria for public use and military airports (discussed under Threshold NOI-3, below).

Detailed quantitative analysis of potential impacts is not practical given the high-level (programmatic) nature of the proposed Plan and the lack of specific project details. For this reason, the analysis is largely qualitative, supplemented with published data or sample calculations, where possible, to illustrate the points discussed in the analysis.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Between 2016 and 2025, regional population is forecasted to increase by 161,338 people (5 percent), adding 97,661 housing units (8 percent) and 115,328 jobs (7 percent). Much of this growth will occur in and around cities throughout the region. To accommodate regional growth by 2025, new development would include new housing units, services, commercial areas, industrial centers, schools, and civic uses.

New development could occur throughout the region and could result in new or increased noise at nearby land uses. Noise increases would be variable and dependent on the location of the improvements relative to the land uses, presence of shielding between the sources and receiver, and the existing ambient noise level from other nearby noise sources. Other factors that would affect the character of the noise increase would be the nature of the noise. Construction noise sources including conventional construction equipment such as bulldozers, graders, and backhoes could represent a temporary increase at nearby land uses. For projects where high impact construction equipment such as pile driving, blasting, or rock drilling would be necessary, a temporary increase would occur at nearby land uses as well as at land uses farther away. Based on noise levels in Table 4.13-4, conventional construction equipment would be on the order of 83 dBA at a distance of 50 feet and 94 dBA for high impact construction equipment (pile driving). Therefore, construction noise would attenuate to 75 dBA at distances of 125 and 400 feet, respectively (based on an attenuation rate of 6 dB per doubling of distance).[2] Stationary noise may also result in a permanent increase in noise at nearby land uses as new sources such as HVAC systems could exceed relevant thresholds outlined in the local jurisdictions municipal codes or general plans.

Additionally, regional growth and land use change could introduce new noise-sensitive receptors in areas that may exceed the local jurisdictional thresholds. As discussed in Section 4.13.2, *Regulatory Setting,* local jurisdictions have adopted both regulations promulgated in the jurisdiction's municipal codes and/or general plans. Adherence to these regulations would be required. Additionally, federal or State requirements for noise reduction may be required dependent on the type of development and the presence of a federal action or nexus. However, while adherence to regulations would reduce noise impacts, there is no assurance that noise impacts would be below levels of significance. As such, impacts of regional growth and land use change as they relate to noise would be significant.

[2] Distances are considered conservative as they do not account for excess ground attenuation, or the presence of intervening structures such as barriers, topography, or buildings.

Transportation Network Improvements and Programs

Improvements to transportation networks such as new managed or toll lanes, or general operational improvements that would increase capacity along the freeway network throughout the region, as well as improvements to arterial streets could result in new or increased noise at nearby land uses.[3] Operational increases in noise could result from an increase in traffic volumes and/or a change in the vehicle mix, which could exceed either local municipal, State, and/or federal thresholds. Noise increases would be variable and dependent on the location of improvements relative to the land uses, the presence of shielding between the sources and receiver, and the existing ambient noise level from other nearby noise sources. Noise from operational additions such as new toll or managed lanes would generally increase the noise levels from the facility incrementally. A 3 dB increase would require a doubling of the noise sources. Therefore, noise increases may not be perceptible at nearby noise-sensitive land uses.

Transportation projects would be subject to the requirements of the local jurisdiction discussed above in Section 4.13.2. Transportation network projects with federal involvement or located on the state highway system would be required to comply with federal (23 CFR 772) and State (Caltrans) guidance. For projects with federal involvement to be subject to the requirements of 23 CFR 772, the project would have to meet the definition of a Type I project (as defined in Section 4.13.1). If a project did not meet the definition, it would not require noise analysis regardless of any Federal nexus. Therefore, while noise from freeway facilities may only increase incrementally, these increases may still result in impacts.

Other improvements include the Otay Mesa Port of Entry (POE) Commercial Vehicle Enforcement Facility (CVEG) modernization; pilot programs for streamlining commercial vehicle operations for reducing wait times at the Otay Mesa POE; improvements to the Otay Mesa POE southbound truck route, including Otay Truck Route and La Media Road; and tolling equipment and Regional Border Management System investments on State Route (SR) 11. Support for ongoing maintenance and rehabilitation of the Complete Corridor system are also included in the 2025 phase. Similar to the transportation network projects above, these would likely be subject to local, State, and/or federal requirements.

Transit-oriented improvements are proposed in the Phased Transit Leap improvements, including double-tracking at certain locations on the Los Angeles–San Diego–San Luis Obispo (LOSSAN) rail corridor along with a station addition in the Gaslamp Quarter, San Diego. Rapid Route improvements and operational support, maintenance facilities, and vehicle purchases are included in the 2025 phase, as are local bus route frequency enhancements. These improvements could result in new or increased noise at nearby land uses. Operational increases in noise could result from an increase in rail or rapid bus transit traffic, which could exceed either local municipal, State, and/or federal thresholds. Similar to transportation improvements, noise increases would be variable and dependent on the location of improvements relative to the land uses, the presence of shielding between the sources and receiver, and the existing ambient noise level from other nearby noise sources. As referenced above, an increase of 3 dB would result from a doubling of the source noise, such as from increased operation of passenger and freight trains from doubling tracking or increased bus services from new Rapid Routes. While increases of this nature may not be noticeable, impacts may still occur.

[3] Chapter 2 includes a complete list of interstate and state highways and facilities where proposed improvements are anticipated.

FTA guidance determines impacts based on the increase associated with the project over the ambient noise level (Figure 4.13-2). As such impacts could occur that would require consideration. Additionally, new operational stationary or maintenance noise sources could result in increased noise levels at nearby land uses. Any improvements associated with the Phased Transit Leap Network would be subject to the requirements of the local jurisdiction, as discussed above in Section 4.13.2, as well as federal (FTA Noise and Vibration Guidance and FRA regulations) requirements. Projects subject to the requirements of the FTA guidance that are at or exceed the screening distances from noise-sensitive receptors, as listed Table 4.13-3, may not require detailed noise analysis.

Construction noise sources associated with transportation network improvements could result in a temporary increase at nearby land uses dependent on the factors listed above. As discussed construction noise would likely attenuate to 75 dBA within 125 and 400 feet for conventional and high impact construction equipment, respectively. Construction noise sources for either of these types of improvements would be subject to the requirements of local jurisdictions, and/or State requirements such as SS 14-8.02 or the guidance in the *FTA Transit Noise and Vibration Manual*.

As discussed in Section 4.13.2 local jurisdictions have adopted both regulations promulgated in their municipal codes and/or general plans. Adherence to these regulations would be required. Federal or State requirements for noise reduction may be required dependent on the type of project and the presence of a federal action or nexus. However, while adherence to regulations would reduce noise impacts, there is no assurance that noise impacts would be reduced to below levels of significance. As such, impacts from transportation network improvements and programs as they relate to noise are significant.

2025 Conclusion

Between 2016 and 2025, regional growth and land use change and transportation network improvements could increase noise levels throughout the region, resulting in new or increased noise impacts that exceed applicable standards or represent substantial increases in ambient noise levels. Therefore, the impact (NOI-1) in the year 2025 would be significant.

2035

Regional Growth and Land Use Change

Between 2026 and 2035, regional population is forecasted to increase by 149,500 people (4 percent), adding 121,650 housing units (9 percent) and 159,728 jobs (9 percent). Similar to horizon year 2025, growth will occur in and around cities throughout the region. To accommodate regional growth by 2035, new development would include new housing units, services, commercial areas, industrial centers, schools, and civic uses.

New development could occur throughout the region and could result in new or increased noise at nearby land uses. Noise increases would be variable, as discussed above in horizon year 2025. Construction noise sources could represent a temporary increase at nearby land uses. It is anticipated that construction noise would attenuate to 75 dBA at distances of 125 feet (for conventional construction equipment) and 400 feet (for high impact construction equipment). Stationary noise sources may also result in a permanent increase in noise at nearby land uses. Additionally, regional growth and land use change could introduce new noise-sensitive receptors in areas that may exceed the local jurisdictional thresholds. As discussed above under year 2025, adherence to applicable regulations would be required. However, while adherence to regulations would reduce

noise impacts, there is no assurance that noise impacts would be reduced below levels of significance. As such, impacts of regional growth and land use change as they relate to noise would be significant.

Transportation Network Improvements and Programs

Improvements to transportation network include new managed lanes and connectors along the regional interstate and state highway system as well as improvements to arterial streets, which could result in new or increased noise at nearby land uses.[4] As discussed above, operational increases in noise would be dependent on a variety of factors and could exceed either local municipal, State, and/or federal thresholds. Similar to horizon year 2025, operational increases may only increase incrementally. However, transportation projects would be subject to the requirements of the local jurisdiction discussed above in Section 4.13.2. Transportation network projects with federal involvement or located on the state highway system would be required to comply with federal (23 CFR 772) and State (Caltrans) guidance. For projects with federal involvement to be subject to the requirements of 23 CFR 772, the project would have to meet the definition of a Type I project (as defined in Section 4.13.2). If a project did not meet the definition, the project would not require noise analysis regardless of any federal nexus. Other improvements that are planned during this time horizon that may not be subject to federal requirements could include expected ATDM improvements along the federal and state highway systems as well as shoulder widening projects. Therefore, while noise from freeway facilities may only increase incrementally, these increases may still result in impacts.

Other transportation-oriented improvements could include Phased Transit Leap improvements, including double-tracking at certain locations on LOSSAN rail corridor along with increases in COASTER frequencies, the Del Mar Tunnel and along the Green Line, new stations at the Central Mobility Hub and at Camp Pendleton, and a Grade Separation at Leucadia Boulevard. Other transit-based improvements would include the Anchor Mobility Hub at the San Ysidro Transit Center and various Rapid Routes along the Central Mobility Hub. The 2035 phase also includes a major new commuter rail line (Route 582) between National City and Sorrento Mesa in addition to light rail investments with SPRINTER, Blue Line, and Orange Line double-tracking and grade separations. Improvements during the 2035 horizon year could result in new or increased noise at nearby land uses similar to horizon year 2025. As referenced above, an increase of 3 dB would result from a doubling of the source noise, such as from increased operation of passenger and freight trains from double-tracking or increased bus services from new Rapid Routes. While increases of this nature may not be noticeable, impacts may still occur.

FTA guidance determines impacts based on the increase associated with the project over the ambient noise level (Figure 4.13-2). As such, impacts could occur that would require consideration. Operational increases in noise would be variable and could result from an increase in rail or rapid bus transit traffic that could exceed either local municipal thresholds or State and/or federal thresholds. New operational stationary or maintenance noise sources could result in increased noise levels at nearby land uses. Any improvements associated with the Phased Transit Leap Network would be subject to the requirements of the local jurisdiction discussed above in Section 4.13.2 as well as federal (FTA Noise and Vibration Guidance and FRA regulations) requirements. Projects subject to the requirements of the FTA guidance that are at or exceed the screening distances from noise-sensitive receptors, as listed Table 4.13-3, may not require detailed noise analysis.

[4] Chapter 2 includes a complete list of interstate and state highways and facilities where proposed improvements are anticipated.

Construction noise sources associated with transportation network improvements or Phased Transit Leap Network Improvements could result in a temporary increase at nearby land uses dependent on the factors listed above. Construction noise would likely attenuate to 75 dBA within 125 and 400 feet for conventional and high impact construction equipment, respectively. Construction noise sources for either of these types of improvements would be subject to the requirements of local jurisdictions, and/or State requirements such as SS 14-8.02 or the guidance in the *FTA Transit Noise and Vibration Manual*.

As discussed above for the 2025 phase, adherence to federal, State, and local regulations would be required. However, while adherence to regulations would reduce noise impacts, there is no assurance that impacts would be reduced below levels of significance. As such, impacts from transportation network improvements and programs as they relate to noise would be significant.

2035 Conclusion

Between 2026 and 2035, regional growth and land use change and transportation network improvements could increase noise levels throughout the region, resulting in new or increased noise impacts that exceed applicable standards or represent substantial increases in ambient noise levels. Therefore, the impact (NOI-1) in the year 2035 would be significant.

2050

Regional Growth and Land Use Change

By 2050, regional population is forecasted to increase by 125,725 people (3 percent), adding 61,433 housing units (4 percent) and 164,843 jobs (8 percent). Similar to horizon years 2025 and 2035, growth will occur in and around cities throughout the region. To accommodate regional growth by 2025, new development would include new housing units, services, commercial areas, industrial centers, schools, and civic uses.

New development could occur throughout the region and could result in new or increased noise to nearby land uses. Noise increases would be variable as discussed under horizon year 2025. Construction noise sources could represent a temporary increase at nearby land uses. It is anticipated that construction noise would attenuate to 75 dBA at distances of 125 feet (for conventional construction equipment) and 400 feet (for high impact construction equipment). Other factors that would affect the character of the noise increase would be the nature of the noise increase. Construction noise sources could represent a temporary increase at nearby land uses dependent on the factors listed above, whereas installation of stationary noise sources may also result in a permanent increase in noise at nearby land uses. Additionally, regional growth and land use change could introduce new noise-sensitive receptors in areas that may exceed the local jurisdictional thresholds. As discussed above under years 2025 and 2035, adherence to applicable regulations would be required. However, while adherence to regulations would reduce noise impacts, there is no assurance that impacts would be reduced below levels of significance. As such, impacts of regional growth and land use change as they relate to noise would be significant.

Transportation Network Improvements and Programs

Improvements to transportation network include new managed lanes throughout the region as well as improvements to arterial streets, which could result in new or increased noise at nearby land uses.[5] Operational increases in noise could result from an increase in traffic volumes and/or a change in the vehicle mix, which could exceed either local municipal, State, and/or federal thresholds. Noise increases would be variable and dependent on the location of improvements relative to the land uses, presence of shielding between the sources and receiver, and the existing ambient noise level from other nearby noise sources. Transportation projects would be subject to the requirements of the local jurisdictions discussed above in Section 4.13.2. Transportation network projects with federal involvement or located on the state highway system would be required to comply with federal (23 CFR 772) and State (Caltrans) guidance. For projects with federal involvement to be subject to the requirements of 23 CFR 772, the project would have to meet the definition of a Type I project (as defined in Section 4.13.2). If a project did not meet the definition, the project would not require noise analysis regardless of any federal nexus. Therefore, while noise from freeway facilities may only increase incrementally, these increases may still result in impacts.

Other transportation-oriented improvements could include Phased Transit Leap improvements, including double-tracking at certain locations on LOSSAN rail corridor along with increases in COASTER frequencies. The 2050 phase also includes three major new commuter rail lines: between Downtown San Diego and El Cajon (Route 581); National City to the U.S. Border (Route 582 [Extension]), and the Central Mobility Hub to the U.S. Border (Route 583). There are also planned light rail investments with SPRINTER, Green Line, and Orange Line double-tracking, as well as double-tracking and grade separations on the Blue Line. Other transit-based improvements would include Rapid Routes throughout the region. Improvements during the 2050 horizon year could result in new or increased noise at nearby land uses similar to horizon years 2025 and 2035. As referenced above, an increase of 3 dB would result from a doubling of the source noise, such as from increased operation of passenger and freight trains from double-tracking or increased bus services from new Rapid Routes. While increases of this nature may not be noticeable, impacts may still occur. FTA guidance determines impacts based on the increase associated with the project over the ambient noise level (Figure 4.13-2). As such impacts could occur that would require consideration. Operational stationary or maintenance noise sources could result in increased noise levels at nearby land uses. Any improvements associated with the Phased Transit Leap Network would be subject to the requirements of the local jurisdiction, as discussed in Section 4.13.2, as well as federal (FTA Noise and Vibration Guidance and FRA regulations) requirements. Projects subject to the requirements of the FTA guidance that are at or exceed the screening distances from noise-sensitive receptors, as listed Table 4.13-3, may not require detailed noise analysis.

Construction noise sources associated with transportation network improvements or Phased Transit Leap Network Improvements could result in a temporary increase at nearby land uses dependent on the factors listed above. Construction noise would likely attenuate to 75 dBA within 125 and 400 feet for conventional and high impact construction equipment, respectively. Construction noise sources for either of these types of improvements would be subject to the requirements of local jurisdictions and/or State requirements such as SS 14-8.02 or the guidance in the *FTA Transit Noise and Vibration Manual*.

[5] Chapter 2 includes a complete list of interstate and state highways and facilities where proposed improvements are anticipated.

As discussed under the 2025 and 2035 phases, adherence to federal, State, and local regulations would be required. However, while adherence to regulations would reduce noise impacts, there is no assurance that impacts would be reduced below levels of significance. As such, impacts from transportation network improvements and programs as they relate to noise are significant.

2050 Conclusion

Between 2036 and 2050, regional growth and land use change and transportation network improvements could increase noise levels throughout the region, resulting in new or increased noise impacts that exceed applicable standards or represent substantial increases in ambient noise levels. Therefore, the impact (NOI-1) in the year 2050 would be significant.

Exacerbation of Climate Change Effects

No climate change effects on the generation of a substantial temporary or permanent increase in ambient noise levels have been documented. The proposed Plan is not expected to exacerbate climate change effects on generation of a substantial temporary or permanent increase in ambient noise levels.

MITIGATION MEASURES

NOI-1 GENERATION OF A SUBSTANTIAL TEMPORARY OR PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE VICINITY OF THE PROJECT IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE, OR APPLICABLE STANDARDS OF OTHER AGENCIES; OR GENERATE A SUBSTANTIAL ABSOLUTE INCREASE IN AMBIENT NOISE

2025, 2035, and 2050

NOI-1a Implement Construction Noise Reduction Measures for Development Projects and Transportation Network Improvements. During project-level CEQA review and during construction of development projects and transportation network improvements, the County of San Diego, cities, and other local jurisdictions can and should, SANDAG shall, and other transportation project sponsors can and should, implement construction noise reduction measures to substantially lessen the exposure of noise-sensitive receptors to construction noise levels to achieve applicable noise standards or prevent substantial temporary increases in noise levels in the planning, design, project-level CEQA review, and construction of development projects or transportation network improvements. These measures should include, but are not limited to, the following.

- Maintain construction equipment and vehicles per manufacturers' specifications and fit equipment with noise suppression devices (e.g., improved mufflers, equipment redesign, intake silencers, wraps, ducts, engine enclosures).
- Minimize construction equipment idling when equipment is not in use.
- Provide buffer zones or other techniques between stationary equipment (such as generators, compressors, rock crushers, and cement mixers) and the noise receptor.
- For impact tools (e.g., jack hammers, pavement breakers, rock drills), use hydraulically or electrically powered tools; where use of pneumatic tools is unavoidable, use an exhaust muffler on the compressed

air exhaust. Use external jackets on the tools themselves. Use quieter procedures such as drills rather than impact equipment.

- For rock-crushing or screening operations, place material stockpiles as a noise barrier blocking line-of-sight between the operations and receptors.

In addition, for pile driving or other activities generating greater than 90 dBA during construction of development projects or transportation network improvements, the County of San Diego, cities, and other local jurisdictions can and should, SANDAG shall, and other transportation project sponsors can and should, implement noise reduction measures, including but not limited to, the following.

- Erect temporary noise barriers around the noise generating activities, particularly adjacent to residential buildings.
- Implement "quiet" pile driving technology (such as pre-drilling of piles, the use of more than one pile driver to shorten the total pile driving duration) or vibratory pile-driving, where feasible, in consideration of geotechnical and structural requirements and conditions.
- Monitor the effectiveness of noise attenuation measures by performing compliance noise monitoring at noise-sensitive receptors during construction.

NOI-1b Implement Operational Noise Reduction Measures for Transportation Network Improvements. During the planning, design, and project-level CEQA review, and construction of transportation network improvements, SANDAG shall, and other transportation project sponsors can and should, implement operational noise reduction measures to substantially lessen the exposure of noise-sensitive receptors to construction noise levels to achieve applicable noise standards or prevent substantial permanent increases in noise levels. These measures should include, but are not limited to, the following.

- Utilize techniques such as grade separation, buffer zones, landscaped berms, dense plantings, sound walls, reduced-noise paving materials, building insulation, and traffic calming measures.

In addition, for railway projects, SANDAG shall, and other transportation project sponsors can and should, implement measures to substantially lessen noise levels to achieve FTA/FRA railway noise exposure thresholds during planning, design, and project-level CEQA review. These measures should include, but are not limited to, the following.

- Use wheel treatments such as damped wheels and resilient wheels.
- Use vehicle treatments such as vehicle skirts and under car acoustically absorptive material.
- Establish sufficient buffer zones between railroad and receptors.
- Use sound reduction barriers such as landscaped berms and dense plantings.
- Install sound insulation treatments for impacted structures.
- Implement FRA "quiet zone" requirements in cooperation with local jurisdictions (i.e., reducing or eliminating the requirement for train locomotives to blast their horns) for Plan improvements at new and existing at-grade rail crossings.
- Conduct project-level noise analysis for new and expanded rail corridors and features such as new rail tracks and double-tracking to ensure that measures are implemented to substantially lessen noise levels that exceed applicable standards.

NOI-1c Implement Operational Noise Reduction Measures for Development Projects. During planning, design, and project-level CEQA review of development projects, the County of San Diego, cities, and other local jurisdictions can and should implement noise reduction measures to meet local noise standards, including but not limited to, the following.

- Use land use measures such as zoning, site design, and buffers to ensure that future development is noise compatible with adjacent transportation facilities and land uses.
- Site noise-sensitive land uses away from noise-generating facilities. Once sited, orient outdoor use areas of land uses (e.g., backyards) away from adjacent noise sources to shield area with buildings, or construct noise barriers to reduce exterior noise levels.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Mitigation measures NOI-1a, NOI-1b, and NOI-1c would substantially reduce significant noise impacts caused by exceedances of noise standards. However, it cannot be guaranteed that all future project-level impacts would be mitigated to a less than significant level. Therefore, this impact (NOI-1) would remain significant and unavoidable.

NOI-2 GENERATION OF EXCESSIVE GROUNDBORNE VIBRATION OR GROUNDBORNE NOISE LEVELS

ANALYSIS METHODOLOGY

This section discusses the construction and operational vibration impacts of forecasted regional growth and land use change, and planned transportation network improvements in comparison to the applicable standards and guidelines. Few of the local jurisdictions (cities and County) provide vibration criteria; therefore, guidance and criteria from FTA and Caltrans are used. Vibration impacts (NOI-2) are considered significant if they exceed the criteria provided by FTA or Caltrans (as applicable, depending on project type) for human annoyance/disturbance or building damage.

Detailed quantitative analyses of potential impacts is not practical given the high-level (programmatic) nature of the proposed Plan and the lack of specific project details. For this reason, the analysis is largely qualitative, supplemented with published data or sample calculations, where possible, to illustrate the points discussed in the analysis.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Between 2016 and 2025, regional population is forecasted to increase by 125,725 people (3 percent), adding 61,433 housing units (4 percent) and 164,843 jobs (8 percent). Growth will occur in and around cities throughout the region. To accommodate regional growth by 2025, new development would include new housing units, services, commercial areas, industrial centers, schools, and civic uses.

Vibration sources associated with new development such as housing and commercial development are generally associated with conventional construction equipment which could expose nearby vibration-sensitive land uses to levels of vibration that exceed local or State thresholds for damage or annoyance. Both Caltrans and the FTA include vibration criteria for damage and human annoyance (Tables 4.13-8 through 4.13-11) that can also be applied to land use project construction. Other local jurisdictions within the region also have vibration thresholds. Additionally, construction may include vibration generating equipment in close proximity to fragile buildings or sensitive receptors and may include vibration intensive equipment, such as pile-drivers. Therefore, construction vibration impacts are significant.

However, operational vibration from residential and commercial sources are generally associated with vehicles such as trucks accessing local roadway networks. These sources generally do not produce noticeable levels of vibration. Therefore, impacts from operations would be less than significant.

Transportation Network Improvements and Programs

Transportation network improvements along highway facilities include new Managed Lanes on Interstate (I-) 5 from Manchester Avenue to Vandegrift, new toll lanes on SR 11 to the Otay Mesa POE, Interchange and Arterial Operational improvements at SR 94 and SR 125, and regional transportation system improvements along the regional highway system, including investments along: I-5, I-15, SR 15, I-805, I-8, SR 78, SR 56, SR 52, SR 94, SR 54, SR 163, SR 125, SR 905, and SR 67. Improvements to local arterial streets are also planned throughout the region. Other improvements include the Otay Mesa POE CVEG modernization; pilot programs for streamlining commercial vehicle operations for reducing wait times at the Otay Mesa POE; improvements to the Otay Mesa POE southbound truck route, including Otay Truck Route and La Media Road; and tolling equipment and Regional Border Management System investments on SR 11. Support for ongoing maintenance and rehabilitation of the Complete Corridor system are also included in the 2025 phase.

Improvements to transportation networks listed above throughout the region as well as improvements to arterial streets could result in new or increased vibration. Operational vibration increases could result from increased truck or bus traffic accessing the highway or local roadway system. Generally, trucks and buses would not produce significant levels of vibration at distances of more than 25 feet (based on the reference sources listed by the FTA). Vibration sources associated with both construction and operational improvements that occur in proximity to coastal bluffs could result in impacts that would need to be considered. As such impacts from operational improvements along the regional highway and local roadway system would not likely result in significant vibration impacts at nearby receptors.

Transit-oriented improvements included in the Phased Transit Leap improvements include double-tracking at certain locations on the LOSSAN rail corridor along with a station addition in the Gaslamp Quarter, San Diego. Rapid Route improvements and operational support, maintenance facilities, and vehicle purchases are included in the 2025 phase, as are local bus route frequency enhancements. These improvements could result in new or increased vibration at nearby land uses. Increased vibration could result from new or increased rail or rapid bus transit traffic, which could exceed either local municipal, State, and/or federal thresholds. The FTA includes a screening distance tool (Table 4.13-5) that identifies distances to land uses at which vibration would attenuate to below impact levels. Therefore, projects located at distances that exceed these criteria would not likely be subject to levels of vibration that would result in impacts. However, as many of the improvements are located close to vibration-sensitive land uses (including coastal bluffs), improvements associated with the Phased Transit Leap Network would be subject to the requirements of the local jurisdiction discussed above in Section 4.13.2, as well as federal and State (FTA and Caltrans guidance) requirements. Even with compliance with these requirements, impacts would be significant.

Construction vibration sources associated with transportation network improvements or Phased Transit Leap Network Improvements could result in a temporary increase at nearby land uses. Vibration sources could include conventional construction equipment sources such as loaded trucks or bull dozers and/or high impact construction equipment such as pile drivers, or blasting. Improvements would be subject to the requirements of local jurisdiction, State, and/or federal guidance. Even with compliance with these requirements, impacts would be significant.

2025 Conclusion

Improvements associated with regional growth and land use changes and transportation network improvements could generate increases in groundborne vibration or groundborne noise levels. Therefore, the impact (NOI-2) in the year 2025 would be significant for construction relating to both regional growth and transportation network improvements, and relating to operation of transportation network improvements. Non-construction impacts relating to regional growth are less than significant.

2035

Regional Growth and Land Use Change

Between 2026 and 2035, regional population is forecasted to increase by 149,500 people (4 percent), adding 121,650 housing units (9 percent) and 159,728 jobs (9 percent). Similar to horizon year 2025, Growth will occur generally in and around cities throughout the region. To accommodate regional growth by 2035, new development would include new housing units, services, commercial areas, industrial centers, schools, and civic uses.

Vibration sources associated with new development such as housing and commercial development are generally associated with conventional construction equipment which could expose nearby vibration-sensitive land uses to levels of vibration that exceed local or State thresholds for damage or annoyance. Both Caltrans and the FTA include vibration criteria for damage and human annoyance (Tables 4.13-8 through 4.13-11). Other local jurisdictions within the region also have vibration thresholds. Additionally, construction may include vibration generating equipment in close proximity to fragile buildings or sensitive receptors and may include vibration intensive equipment, such as pile-drivers, and thus construction vibration impacts are considered significant.

Operational vibration from residential and commercial sources are generally associated with vehicles such as trucks accessing local roadway networks. These sources generally do not produce noticeable levels of vibration. Therefore, impacts from operations would be less than significant.

Transportation Network Improvements and Programs

Transportation network improvements along highway facilities include new Managed Lanes and Managed Lane Connectors along SR 15, SR 52, SR 94, SR 78, SR 163, SR 125, I-5, I-8, I-15, and I-805 as well as direct access ramps (DARs) along I-5 and SR 125. Local arterial improvements are also planned between 2026 and 2035. These improvements, as well as improvements to arterial streets, could result in new or increased vibration. Operational vibration could result from increased truck or bus traffic accessing the highway or local roadway system. Generally, trucks and buses would not produce significant levels of vibration more than 25 feet (based on the reference sources listed by the FTA). Vibration sources associated with both construction and operational improvements that occur in proximity to coastal bluffs could result in impacts that would need

to be considered. As such impacts from operational improvements along the regional highway and local roadway system would not likely result in significant vibration impacts at nearby receptors.

Other transportation-oriented improvements could include Phased Transit Leap improvements, including double-tracking at certain locations on the LOSSAN rail corridor along with increases in COASTER frequencies, the Del Mar Tunnel and along the Green Line, new stations at the Central Mobility Hub and at Camp Pendleton, and a Grade Separation at Leucadia Boulevard. Other transit-based improvements would include the Anchor Mobility Hub at the San Ysidro Transit Center and various Rapid Routes along the Central Mobility Hub. The 2035 phase also includes a major new commuter rail line (Route 582) between National City and Sorrento Mesa in addition to light rail investments with SPRINTER, Blue Line, and Orange Line double-tracking and grade separations. These improvements could result in new or increased vibration at nearby land uses. Increased vibration could result from new or increased rail or rapid bus transit traffic, which could exceed either local municipal, State, and/or federal thresholds. The FTA includes a screening distance tool (Table 4.13-5) that identifies distances to land uses at which vibration would attenuate to below impact levels. Therefore, projects located at distances that exceed these criteria would not likely be subject to levels of vibration that would result in impacts. However, as many of the improvements are located close to vibration-sensitive land uses (including coastal bluffs), improvements associated with the Phased Transit Leap Network would be subject to the requirements of the local jurisdictions discussed in Section 4.13.2, as well as federal and State (FTA Noise and Vibration Guidance and Caltrans guidance) requirements. Even with compliance with these requirements, impacts would be significant.

Construction vibration sources associated with transportation network improvements or Phased Transit Leap Network Improvements could result in a temporary increase at nearby land uses. Vibration could result from the use of conventional construction equipment sources such as loaded trucks or bull dozers and/or high impact construction equipment such as pile drivers, or from blasting. Improvements would be subject to the requirements of local jurisdiction, State, and/or federal guidance. Even with compliance with these requirements, impacts would be significant.

2035 Conclusion

Improvements associated with regional growth and land use changes and transportation network improvements could generate substantial increases in groundborne vibration or groundborne noise levels. Therefore, the impact (NOI-2) in the year 2035 would be significant for construction relating to both regional growth and transportation network improvements, and relating to operation of transportation network improvements. Non-construction impacts relating to regional growth are less than significant.

2050

Regional Growth and Land Use Change

Between 2026 and 2050, regional population is forecasted to increase by 125,725 people (3 percent), adding 61,433 housing units (4 percent) and 164,843 jobs (8 percent). Similar to horizon years 2025 and 2035, growth will occur in and around cities throughout the region. To accommodate regional growth by 2050, new development would include new housing units, services, commercial areas, industrial centers, schools, and civic uses.

Vibration sources associated with new development such as housing and commercial development are generally associated with conventional construction equipment which could expose nearby vibration-sensitive

land uses to levels of vibration that exceed local or State thresholds for damage or annoyance. Both Caltrans and the FTA include vibration criteria for damage and human annoyance (Tables 4.13-8 through 4.13-11). Other local jurisdictions within the region also have vibration thresholds. Additionally, construction may include vibration generating equipment in close proximity to fragile buildings or sensitive receptors and may include vibration intensive equipment, such as pile-drivers, and thus construction vibration impacts are considered significant.

Operational vibration from residential and commercial sources are generally associated with vehicles such as trucks accessing local roadway networks. These sources generally do not produce noticeable levels of vibration. Therefore, impacts from operations would be less than significant.

Transportation Network Improvements and Programs

Improvements to the regional transportation system improvements along the regional highway system include new Managed Lanes and Managed Lane Connectors along SR 52, SR 56, SR 54, SR 125, and SR 905, and on I-5, I-8, 1 I-5, and I-805, as well as DARs along SR 125 and SR 905. Other improvements are assumed along SR 76, SR 78, SR 79, SR 94, and I-8. Local arterial improvements are also planned during this time frame. Improvements to transportation networks throughout the region as well as improvements to arterial streets could result in new or increased vibration. Operational vibration increases could result from increased truck or bus traffic accessing the highway or local roadway system. Generally, trucks and buses would not produce significant levels of vibration more than 25 feet (based on the reference sources listed by the FTA). As such, impacts from operational improvements along the regional highway and local roadway system would not likely result in significant vibration impacts at nearby receptors.

Other transportation-oriented improvements could include Phased Transit Leap improvements, including double-tracking at certain locations on LOSSAN rail corridor along with increases in COASTER frequencies. This phase also includes three major new rail lines with routes between Downtown San Diego and El Cajon (Route 581); National City to the U.S. Border (Route 582 [Extension]), and the Central Mobility Hub to the U.S. Border (Route 583). It also includes light rail investments with SPRINTER, Green Line, and Orange Line double-tracking, as well as double-tracking and grade separations on the Blue Line. Other transit-based improvements would include Rapid Routes throughout the region.

These improvements could result in new or increased vibration at nearby land uses. Increased vibration could result from new or increased rail or rapid bus transit traffic, which could exceed either local municipal, State, and/or federal thresholds. The FTA includes a screening distance tool (Table 4.13-5) that identifies distances to land uses at which vibration would attenuate to below impact levels. Therefore, projects located t distances that exceed these criteria would not likely be subject to levels of vibration that would result in impacts. However, as many of the improvements are located close to vibration-sensitive land uses, improvements associated with the Phased Transit Leap Network would be subject to the requirements of the local jurisdictions discussed in Section 4.13.2, as well as federal and State (FTA Noise and Vibration Guidance and Caltrans guidance) requirements. Even with compliance with these requirements, impacts would be significant.

Construction vibration sources associated with transportation network improvements or Phased Transit Leap Network Improvements could result in a temporary vibration increase at nearby land uses. Vibration sources could include conventional construction equipment such as loaded trucks or bull dozers, and/or high impact construction equipment such as pile drivers, or blasting. Improvements would be subject to the requirements of local jurisdiction, State, and/or federal guidance. Even with compliance with these requirements, impacts would be significant.

2050 Conclusion

Improvements associated with regional growth and land use changes and transportation network improvements could generate substantial increases in groundborne vibration or groundborne noise levels. Therefore, the impact (NOI-2) in the year 2050 would be significant for construction relating to both regional growth and transportation network improvements, and relating to operation of transportation network improvements. Non-construction impacts relating to regional growth are less than significant.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects on generation of excessive groundborne vibration or noise levels.

MITIGATION MEASURES

NOI-2 GENERATION OF EXCESSIVE GROUNDBORNE VIBRATION OR GROUNDBORNE NOISE LEVELS

2020, 2035, and 2050

NOI-2a Implement Construction Groundborne Vibration and Noise Reduction Measures. SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, implement measures during design, project-level CEQA review, and construction of transportation network improvements or development projects, to reduce groundborne vibration and noise levels generated by onsite construction equipment, including, but not limited to, the following.

- Predrill pile holes within 300 feet of any sensitive receptor.
- Where feasible, use soil mix wall for excavation.
- Incorporate a comprehensive construction vibration specification into all construction bid documents.
- Require contractor to assess potential for damage to buildings within 100 feet of a tunnel boring.
- Require contractor to perform a physical survey to document existing condition of a building that might incur damage.
- If pile driving and/or other vibration-generating construction activities are to occur within 60 feet of a historic structure whose integrity would be impaired by exceeding the vibration threshold for historic structures, implement measures to reduce vibration impacts, including but not limited to, the following.
    - Retain a structural engineer or other appropriate professional to determine threshold levels of vibration and cracking that would damage any historic structure, and design construction methods to not exceed the thresholds.
    - Require groundborne vibration monitoring of nearby historic structures. Implement a monitoring program to detect ground settlement or lateral movement of structures in the vicinity of pile-driving activities and identify corrective measures to be taken should monitored vibration levels indicate the potential for vibration damage to historic structures.
    - Require contractor to assess potential damage to buildings within 200 feet of areas where excavation requires the use of driven piles either by impact or vibratory methods.

NOI-2b Implement Groundborne Vibration and Noise-Reducing Measures for Rail Operations. SANDAG shall, and other transportation project sponsors can and should, implement vibration-reducing measures to meet FTA vibration guidelines (FTA 2018) during the planning, design, project-level CEQA review, construction, and operation of rail projects, including, but not limited to, providing special track support systems such as floating slabs, resiliently supported ties, high-resilience fasteners, and ballast mats.

In addition, rail operators can and should implement groundborne vibration and noise-reducing measures to meet applicable FTA vibration guidelines (FTA 2018) during the planning, design, project-level CEQA review, construction, and operation of rail projects, including, but not limited to, the following.

- Conduct rail grinding on a regular basis to keep tracks smooth.
- Conduct wheel truing to re-contour wheels to provide a smooth running surface and removing wheel flats.
- To reduce groundborne noise, achieve vibration isolation of the track from underlying surface using the following.
    - Highly resilient direct fixation fasteners
    - Rail suspended fastener system
    - Isolated slab track system
    - Floating slab track system

SIGNIFICANCE AFTER MITIGATION

Mitigation measures NOI-2a and NOI-2b would substantially reduce significant vibration impacts caused by exceedances of groundborne vibration criteria. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less than significant level. Therefore, this impact (NOI-2) would remain significant and unavoidable.

NOI-3 FOR A PROJECT LOCATED WITHIN THE VICINITY OF A PRIVATE AIRSTRIP OR AN AIRPORT LAND USE PLAN OR, WHERE SUCH A PLAN HAS NOT BEEN ADOPTED, WITHIN TWO MILES OF A PUBLIC AIRPORT OR PUBLIC USE AIRPORT, THE PROJECT WOULD EXPOSE PEOPLE RESIDING OR WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS.

ANALYSIS METHODOLOGY

This section discusses the potential noise impacts of locating land development and transportation improvements of the proposed Plan in proximity to public-use and military airports, or private airstrips and helipads in the San Diego region.

The locations of forecasted regional growth and land use change, as well as planned transportation improvements, associated with the proposed Plan are analyzed to determine whether people residing by or working near public-use airports and military airfields, or private airstrips and helipads would be exposed to excessive noise levels. *Excessive* is defined as exceeding land use compatibility noise level limits in ALUCPs or AICUZ studies for public-use and military airports, and in FAA and Caltrans Aeronautics Division regulations and permitting for private airstrips or helipads.

Detailed quantitative analyses of potential impacts is not practical given the high-level (programmatic) nature of the proposed Plan and the lack of specific project details. For this reason, the analysis is largely qualitative, supplemented with published data or sample calculations, where possible, to illustrate the points discussed in the analysis.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Between 2016 and 2025, regional population is forecasted to increase by 125,725 people (3 percent), adding 61,433 housing units (4 percent) and 164,843 jobs (8 percent). Growth will occur in and around cities throughout the region. To accommodate regional growth by 2025, new development would include new housing units, services, commercial areas, industrial centers, schools, and civic uses.

The regional growth plans would not result in operational changes to flight plans, ALUCPs, or AICUZs. However, regional growth could result in noise-sensitive (generally residential) land uses being developed along the flight paths of some of the regional airports or even within some ALUCPs or AICUZs. Regional airports and air installations are described above under Section 4.13.1 (Aircraft Noise). As the locations of new housing are not known, it is possible that new housing could be developed in proximity to a ALUCP or AICUZ, or within 2 miles of an airport. Many of the local jurisdictions' general plans include land use compatibility guidelines that designate acceptable levels of noise, which would be applicable for airport noise. Additionally, the procedures included in the ALUCPs or AICUZs would reduce noise exposure from airport noise.

For airstrips, separation between developed land uses and the facilities would be identified in project-level planning or CEQA review. Separation between private airports and development is identified in accordance with FAA standards. Compliance with local jurisdiction general plans and FAA standards would reduce noise from airstrips and ensure land use compatibility with any new development. Therefore, while regional growth and land use change would result in increased residences located throughout the region; however, based on the discussion above, it would not result in residents being exposed to excessive noise from public or military airfields, or private airstrips. Therefore, impacts would be less than significant.

Transportation Network Improvements and Programs

Neither the Corridor Network or Phased Transit Leap Network Improvements would develop noise-sensitive land uses within the region or within an ALUCP or AICUZ. Transportation network improvements would include highway widenings, double-tracking of rail lines, and support and maintenance facilities. Improvements of this nature are not considered noise sensitive. Therefore, impacts would be less than significant.

2025 Conclusion

Improvements associated with regional growth between 2016 and 2025 would not expose noise-sensitive land uses to levels of noise in excess of applicable standards. As such, the impact (NOI-3) in the year 2025 would be less than significant.

2035

Regional Growth and Land Use Change

Between 2026 and 2035, regional population is forecasted to increase by 149,500 people (4 percent), adding 121,650 housing units (9 percent) and 159,728 jobs (9 percent). Similar to horizon year 2025, growth will occur generally in and around cities throughout the region. To accommodate regional growth by 2035, new development would include new housing units, services, commercial areas, industrial centers, schools, and civic uses.

As discussed under 2025, many of the local jurisdictions' general plans include land use compatibility guidelines that designate acceptable levels of noise, which would be applicable for airport noise. Additionally, the procedures included in the ALUCPs or AICUZs would reduce noise exposure from airport noise. Compliance with local jurisdiction general plans and FAA standards would reduce noise from airstrips and ensure land use compatibility with any new development. Therefore, while regional growth and land use change would result in increased residences located throughout the region, it would not result in residents being exposed to excessive noise from public or military airfields, or private airstrips. Therefore, impacts would be less than significant.

Transportation Network Improvements and Programs

As discussed above, neither the Corridor Network nor Phased Transit Leap Network Improvements would develop noise-sensitive land uses within the region or within an ALUCP or AICUZ. Therefore, impacts would be less than significant.

2035 Conclusion

Improvements associated with regional growth between 2026 and 2035 would not expose noise-sensitive land uses to levels of noise in excess of applicable standards. As such, the impact (NOI-3) in the year 2035 would be less than significant.

2050

Regional Growth and Land Use Change

Between 2036 and 2050, regional population is forecasted to increase by 125,725 people (3 percent), adding 61,433 housing units (4 percent) and 164,843 jobs (8 percent). Similar to horizon years 2025 and 2035, growth will occur in and around cities throughout the region. To accommodate regional growth by 2025, new development would include new housing units, services, commercial areas, industrial centers, schools, and civic uses.

As discussed under the 2025 and 2035 analyses, many of the local jurisdictions' general plans include land use compatibility guidelines that designate acceptable levels of noise, which would be applicable for airport noise. Additionally, the procedures included in the ALUCPs or AICUZs would reduce noise exposure from airport noise. Compliance with local jurisdiction general plans and FAA standards would reduce noise from airstrips and ensure land use compatibility with any new development. Therefore, while regional growth and land use changes would result in increased residences located throughout the region, it would not result in residents being exposed to excessive noise from public or military airfields, or private airstrips. Therefore, impacts would be less than significant.

Transportation Network Improvements and Programs

As discussed above, neither the Corridor Network nor Phased Transit Leap Network Improvements would develop noise-sensitive land uses within the region or within an ALUCP or AICUZ. Therefore, impacts would be less than significant.

2050 Conclusion

Improvements associated with regional growth between 2036 and 2050 would not expose noise-sensitive land uses to levels of noise in excess of applicable standards. As such, the impact (NOI-3) in the year 2050 would be less than significant.

Exacerbation of Climate Change Effects

No climate change effects on exposing people near airports to excessive noise levels have been documented. The proposed Plan is not expected to exacerbate climate change effects on exposing people near airports to excessive noise levels.

4.14 POPULATION AND HOUSING

This section evaluates the population and housing impacts of the proposed Plan.

4.14.1 EXISTING CONDITIONS

The following describes the existing population, housing units, and jobs within the San Diego region and provides a brief discussion of SANDAG's growth forecasting process.

EXISTING POPULATION, HOUSING UNITS, AND EMPLOYMENT

Table 4.14-1 details the existing regional population, housing units, and jobs for the 18 incorporated cities and unincorporated County. Existing population, housing unit, and employment densities for the region are also represented on Figures 2-5, 2-9, and 2-13 in Chapter 2, *Project Description*.

Table 4.14-1
Existing Population, Housing Units, and Employment by Jurisdiction

Jurisdictions	2016 Population	2016 Housing Units	2016 Jobs
Carlsbad	113,179	46,152	76,617
Chula Vista	265,357	82,794	74,078
Coronado	24,512	9,577	26,888
Del Mar	4,284	2,611	4,476
El Cajon	105,276	36,012	48,408
Encinitas	62,625	26,040	28,812
Escondido	150,978	48,462	58,323
Imperial Beach	28,041	9,756	5,621
La Mesa	60,980	25,760	30,188
Lemon Grove	26,710	9,032	9,099
National City	61,350	16,641	42,218
Oceanside	176,666	65,851	47,256
Poway	49,986	16,606	35,297
San Diego	1,399,925	531,423	892,828
San Marcos	94,258	30,539	41,527
Santee	56,434	20,525	18,499
Solana Beach	13,860	6,497	10,064
Vista	102,933	32,195	44,105
Unincorporated	512,156	174,082	152,115
Region	3,309,510	1,190,555	1,646,419

Source: SANDAG 2021a.

Population

The existing (2016) population of the San Diego region is 3,309,510. The City of San Diego is the most populous in the region with an existing population of 1,399,925, which is 42 percent of the regional total. The

unincorporated County (512,156; 16 percent) and Chula Vista (265,357; 8 percent) have the second and third largest populations in the region, respectively. Approximately 66 percent of regional population is in these three jurisdictions. The cities of Oceanside (176,666; 5 percent) and Escondido (150,978; 5 percent) are the next most populated jurisdictions.

Existing Housing Units/Affordable Housing

As of 2016, there are 1,190,555 existing housing units in the San Diego region. Similar to existing population distribution, approximately 67 percent of existing housing units are in the City of San Diego (531,423; 45 percent), unincorporated County (174,082; 15 percent), and Chula Vista (82,794; 7 percent). After these three jurisdictions, the cities of Oceanside (65,851; 6 percent) and Escondido (48,462; 4 percent) account for the most housing units.

The State of California faces a persistent housing crisis, and San Diego County is no exception. Between 1950 and 2019, the housing supply has not kept pace with the growing population of the San Diego region, resulting in rising housing prices. More affordable housing is needed for extremely low, very low, low, and middle income households. Steps at the local, regional, and State level are being taken to address the availability and affordability of housing. For example, cities in the San Diego region have taken steps to increase affordable housing by making the development process faster and easier (City of San Diego 2020). The State of California offers grants to accelerate the production of housing and has approved legislation that allows for more types of homes, such as accessory dwelling units, to be built statewide (SANDAG 2021b). At the local level, agencies such as the San Diego Housing Commission work with developers to build deed-restricted units. Deed-restricted units have documents recorded on the property that set binding maximum rent restrictions, often based on federal, State, or city programs that subsidize the development or operation of the units. Depending on the type of affordability program and subsidy, rental housing regulation on units often have a set time period for affordability, which can be as long as 55 years (San Diego Housing Commission 2020).

Housing affordability is the product of two factors—household incomes and housing costs. Housing is considered affordable if total housing costs are below 30 percent of total household pretax income. In most U.S. cities, housing costs have grown faster than household incomes over the last decade, leading to a growing affordability challenge for low- and middle-income households. San Diego follows this trend, with the increase in median household income between 2010 and 2018 (15 percent inflation-adjusted; $69,200 to $79,700) lagging rent growth (17 percent inflation-adjusted; $1,450 to $1,700). In the same time period, median home values have increased by 31 percent (inflation-adjusted), from $469,300 to $614,000. This caused many households with moderate income (81–120 percent of Area Median Income [AMI]) and above-moderate income (more than 120 percent of AMI) who may have previously purchased a home to remain in the rental market. As more of these households with moderate incomes and above continue to remain in the rental market, either due to a lack of homeownership options or changing preferences, households with low incomes and below compete for the same rental housing units. This further reduces rental vacancy rates, drives up rents, and increases the housing cost burden on those at the lower end of the income spectrum (San Diego Housing Commission 2020).

The median rent in San Diego remains significantly higher than the rent affordable to renters with median incomes. In 2018, the median rent was $1,700, while the rent affordable to the median renter was $1,430. In recent years, this gap has remained steady, as higher-income renters drove both median renter income and rents up by 9 percent since 2015. This trend represents an overall decrease in affordability in the rental market—as the rent affordable to the median renter increases, it becomes unaffordable to a larger portion of lower-income households.

A study conducted by the California Housing Partnership (May 2019) found that cuts in federal and State funding reduced investment in affordable housing in the San Diego region by more than $134 million annually since 2008, which is a 76 percent reduction in funding, The study also showed that 77 percent of extremely low households paid more than half of their income on housing costs compared to just 4 percent of moderate income households.

Employment

There are 1,646,419 existing jobs in the San Diego region. With 892,828 jobs, the City of San Diego accounts for 54 percent of regional employment. Next are the unincorporated County (152,115; 9 percent), Carlsbad (76,617; 5 percent), and Chula Vista (74,078; 5 percent).

According to the State of California Employment Development Department (EDD 2017), the San Diego region had an unemployment rate of 4.0 percent and an available labor force of 1,585,000 individuals before the COVID 19 health emergency. As of June 2021, the San Diego unemployment rate was at 6.8 percent, which is substantially lower that the 16 percent unemployment rate that was experienced at the height of the COVID 19 pandemic (San Diego Workforce Partnership 2021).

SANDAG REGIONAL GROWTH FORECAST SUMMARY

SANDAG has prepared regional growth forecasts for the San Diego region since the 1970s. The SANDAG forecasts are meant to help policy- and decision-makers prepare for the future and are not an expression for or against growth. The forecasts are developed through a collaborative effort with experts in demography, housing, the economy, and other disciplines, with the close cooperation of local planning directors and their staffs.

The latest version of the Series 14 Regional Growth Forecast identifies regional growth in population, housing units, and jobs from 2016 to 2050. It serves as the foundation for the proposed Plan. The Series 14 Regional Growth Forecast is allocated subregionally in development of the proposed Plan (Sustainable Communities Strategy [SCS] land use pattern} and represents a continuing trend in the San Diego region of providing more housing and job opportunities in existing urbanized areas. Since 1999, more than 75 percent of the 19 jurisdictions have made, or are in the process of making, significant updates to their general plans. In 2012 SANDAG forecasted 17 percent of future housing growth would occur in the unincorporated areas of the County under the adopted local general plans at the time. Today, SANDAG expects 4.3 percent of growth to occur in unincorporated areas of the region, with much of that focused in existing villages such as Lakeside, Spring Valley, and North County Metro.

The forecasted growth also reflects more sustainable general plans from the local jurisdictions. At the turn of the century, about 90 percent of vacant residential land in the cities was planned for single-family use. The Series 14 Regional Growth Forecast shows 93 percent of housing growth by 2050 being multifamily. Local and regional conservation programs also continue to protect more of San Diego's sensitive lands. Currently, 1,329,169 acres, or over 49 percent of the region, is preserved as open space, parks, or habitat. However, SANDAG forecasts that a slight decrease of 898 acres in open space, parks, and habitat acreage will occur by 2050. A more detailed discussion of the forecasted growth for the San Diego region is presented in Chapter 2.

Population Growth

From 2016 to 2050, the region is forecasted to have a population increase of 436,563 people—from 3,309,510 to 3,746,073, an increase of 13 percent. Table 4.14-2 shows existing population in 2016 and forecasted

population growth for 2025, 2035, and 2050 for the region and the subregional allocation by jurisdiction based on the SCS land use pattern.

The highest population growth rate increases from 2016 to 2050 are forecasted to occur in the cities of National City (34 percent), San Marcos (27.6), and Chula Vista (21.9 percent). Approximately 82 percent of the population growth increase is forecasted for these three jurisdictions. Forecasted population growth rates in the City of San Diego (17.6 percent), the east county in the City of La Mesa (23.4 percent), and the north county in the City of Escondido (15.5 percent) also would be higher than the regional average of 13 percent. Population growth rates are forecasted to be lower than the regional average in the coastal cities of Oceanside (4.3 percent), Carlsbad (8.1 percent), Encinitas (3.1 percent), Solana Beach (10.2 percent), Del Mar (10.1 percent), Coronado (5.7 percent), and Imperial Beach (11.5 percent); the north county inland cities of Poway (4.3 percent) and City of Vista (4.7 percent); the east county cities of Lemon Grove (11.5 percent) and Santee (3.2 percent), as well as the unincorporated County of San Diego (0.9%).

Table 4.14-2
Existing and Forecasted Population Growth by Jurisdiction

Jurisdictions	2016	2025	2035	2050	Increase (2016–2050)	
					Population	Percent
Carlsbad	113,179	116,163	119,681	122,302	9,123	8.1%
Chula Vista	265,357	284,835	288,141	323,469	58,112	21.9%
Coronado	24,512	24,896	25,669	25,901	1,389	5.7%
Del Mar	4,284	4,384	4,524	4,715	431	10.1%
El Cajon	105,276	106,425	109,207	110,841	5,565	5.3%
Encinitas	62,625	63,476	64,157	64,591	1,966	3.1%
Escondido	150,978	165,127	169,922	174,398	23,420	15.5%
Imperial Beach	28,041	28,902	30,499	31,271	3,230	11.5%
La Mesa	60,980	65,822	71,455	75,276	14,296	23.4%
Lemon Grove	26,710	27,367	29,238	29,784	3,074	11.5%
National City	61,350	69,072	79,986	82,487	21,137	34.5%
Oceanside	176,666	178,385	181,020	184,283	7,617	4.3%
Poway	49,986	50,664	51,744	52,124	2,138	4.3%
San Diego	1,399,925	1,493,403	1,599,353	1,646,129	246,204	17.6%
San Marcos	94,258	102,775	103,903	120,247	25,989	27.6%
Santee	56,434	57,501	57,773	58,268	1,834	3.2%
Solana Beach	13,860	14,171	15,089	15,262	1,402	10.2%
Vista	102,933	104,302	105,707	107,732	4,799	4.7%
Unincorporated	512,156	513,178	513,280	516,993	4,837	0.9%
Region	3,309,510	3,470,848	3,620,348	3,746,073	436,563	13.2%

Source: SANDAG 2021a.

Housing Units

From 2016 to 2050, the number of housing units in the region is forecasted to increase by 280,744, from 1,190,555 to 1,471,299, an increase of 24 percent. Table 4.14-3 shows existing housing units in 2016 and

forecasted housing units for 2025, 2035, and 2050 for the region and the subregional allocation by jurisdiction based on the SCS land use pattern. This table does not include civilian (e.g., dormitories) or military (e.g., barracks) group quarters.

Similar to forecasted increases in population growth, the highest rates of housing unit increases would occur in the south county cities of National City (34.7 percent) and Chula Vista (32.2 percent), the City of San Diego (33.8 percent), the north county City of San Marcos (34.3 percent) and the east county City of La Mesa (33.5 percent). Forecasted housing unit increases in the north county City of Escondido (25.1 percent) also will be higher than the regional average of 24 percent. The rates of housing unit increases are forecasted to be lower than the regional average in the coastal cities of Oceanside (8.4 percent), Carlsbad (14.2 percent), Encinitas (6.3 percent), Solana Beach (13.3 percent), Del Mar (6.4 percent), Coronado (9.5 percent), and Imperial Beach (18.7 percent); the north county inland cities of Poway (8.5 percent); and the east county cities of El Cajon (12.4 percent), Lemon Grove (15.9 percent), and Santee (7 percent), as well as the unincorporated County (4.3 percent). Between 2036 and 2050, no housing growth is projected to occur in the unincorporated County.

Table 4.14-3
Existing and Forecasted Housing Growth by Jurisdiction (Units)

Jurisdictions	2016	2025	2035	2050	Increase (2016–2050)	
					Number	Percent
Carlsbad	46,152	47,855	51,433	52,727	6,575	14.2%
Chula Vista	82,794	91,635	95,621	109,474	26,680	32.2%
Coronado	9,577	9,802	10,486	10,486	909	9.5%
Del Mar	2,611	2,674	2,778	2,778	167	6.4%
El Cajon	36,012	37,582	39,830	40,467	4,455	12.4%
Encinitas	26,040	26,750	27,690	27,690	1,650	6.3%
Escondido	48,462	54,910	58,990	60,618	12,156	25.1%
Imperial Beach	9,756	10,212	11,265	11,576	1,820	18.7%
La Mesa	25,760	28,404	32,282	34,398	8,638	33.5%
Lemon Grove	9,032	9,476	10,467	10,467	1,435	15.9%
National City	16,641	17,908	22,410	22,410	5,769	34.7%
Oceanside	65,851	67,816	71,359	71,359	5,508	8.4%
Poway	16,606	17,092	18,017	18,017	1,411	8.5%
San Diego	531,423	592,143	676,236	711,018	179,595	33.8%
San Marcos	30,539	34,681	34,931	41,016	10,477	34.3%
Santee	20,525	21,161	21,889	21,969	1,444	7.0%
Solana Beach	6,497	6,684	7,364	7,364	867	13.3%
Vista	32,195	33,404	35,317	35,964	3,769	11.7%
Unincorporated	174,082	178,027	181,501	181,501	7,419	4.3%
Region	1,190,555	1,288,216	1,409,866	1,471,299	280,744	23.6%

Source: SANDAG 2021a.

Jobs

From 2016 to 2050, the number of jobs in the region is forecasted to increase by 439,899, from 1,646,419 jobs to 2,086,318 jobs, an increase of 27 percent. Table 4.14-4 shows existing jobs in 2016 and forecasted jobs for 2025, 2035, and 2050 for the region and the subregional allocation by jurisdiction based on the SCS land use pattern.

The highest rates of job increases would occur in the south county cities of Chula Vista (56.8 percent) and National City (44.2 percent), and in San Marcos (50 percent) in inland north county. Forecasted job increases in the east county City of El Cajon (38.7), the City of San Diego (27.8 percent) and the north county City of Carlsbad (27.3 percent) also will be higher than the regional average of 27 percent. The rates of jobs increases are forecasted to be lower than the regional average in the coastal cities of Oceanside (7.4 percent), Encinitas (6.7 percent), Solana Beach (9.6 percent), Del Mar (2.5 percent), and Coronado (7 percent); the north county inland cities of Poway (2.6 percent) and Escondido (18.2 percent); and the east county cities of Lemon Grove (13.6 percent) and Santee (8.7 percent).

Table 4.14-4
Existing and Forecasted Job Growth by Jurisdiction

Jurisdictions	2016	2025	2035	2050	Increase (2016–2050)	
					Number	Percent
Carlsbad	76,617	83,955	90,701	97,507	20,890	27.3%
Chula Vista	74,078	83,027	98,701	116,185	42,107	56.8%
Coronado	26,888	27,283	27,978	28,771	1,883	7.0%
Del Mar	4,476	4,494	4,536	4,586	110	2.5%
El Cajon	48,408	52,526	59,516	67,135	18,727	38.7%
Encinitas	28,812	29,264	29,950	30,753	1,941	6.7%
Escondido	58,323	60,758	64,686	68,924	10,601	18.2%
Imperial Beach	5,621	5,948	6,407	6,946	1,325	23.6%
La Mesa	30,188	31,647	34,145	36,729	6,541	21.7%
Lemon Grove	9,099	9,368	9,846	10,335	1,236	13.6%
National City	42,218	54,193	57,419	60,875	18,657	44.2%
Oceanside	47,256	48,317	49,909	50,756	3,500	7.4%
Poway	35,297	35,508	35,865	36,216	919	2.6%
San Diego	892,828	953,977	1,046,814	1,140,676	247,848	27.8%
San Marcos	41,527	47,021	54,548	62,306	20,779	50%
Santee	18,499	18,829	19,494	20,100	1,601	8.7%
Solana Beach	10,064	10,277	10,648	11,027	963	9.6%
Vista	44,105	45,253	47,133	49,115	5,010	11.4%
Unincorporated	152,115	160,102	173,179	187,376	35,261	23.2%
Region	1,646,419	1,761,747	1,921,475	2,086,318	439,899	26.7%

Source: SANDAG 2021a.

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

The San Diego region is likely to experience sea level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix C.

Climate change-related disasters, such as flooding, wildfire, and sea-level rise, can destroy homes and threaten displacement. For example, a 2015 study looking at the effects of a potential El Niño storm found that 54,560 residents in the San Diego region (1.75 percent of the regionwide population), in 21,706 housing units, reside in areas that are susceptible to flooding during heavy storms and 100-year flood events. These areas include floodplains and places near coastal inlets and rivers and are mostly spread throughout the region (NUSIPR 2015).

Population and housing could be affected by increases in wildfire. In San Diego County, under a high-emissions scenario, the Cal-Adapt wildfire tool estimates a 40 percent increase in annual average acres of burned land by 2100 compared to the annual average between 1950 and 2005. In 2010, 91 percent of residents in the unincorporated county lived in wildfire areas marked Very High, High, or Moderate Risk; and increased wildfire incidence may worsen these risks (County of San Diego 2018). Thus, the effects of climate change may have a negative impact on housing in the San Diego region.

Compared to flooding and wildfire, the housing exposed to sea-level rise is lower —7,498 people live in areas at risk of inundation from a 4.6-foot rise in sea level (County of San Diego 2018). While this is a small percentage of the region's population overall, this impact could be significant for local communities on the coast. Current projections of sea-level rise for the region place the maximum at 4.6 feet by 2100 (County of San Diego 2018). An assessment of costs from coastal flooding-related damage to private residential and commercial structures found that in Carlsbad, a 100-year storm could result in losses of $1.1 million by 2050, and chronic inundation could result in losses of $37.1 million by 2100. In Del Mar, damage to private residential and commercial structures from a 100-year storm can currently result in losses of $46.7 million (Nexus Planning & Research 2017).

High temperatures may make certain parts of the San Diego region more uncomfortable or more damaging to human health due to heat stress than others, possibly resulting in population or housing shifts. Because of the urban heat island effect, although the San Diego region may experience a 4.8°F increase in temperature from climate change by 2050 (see Appendix C), and dense urban areas may feel much hotter (Reidmiller et al. 2018). Extreme heat events in urban areas are found to disproportionately affect vulnerable populations due to urban density (Benz and Burney 2021). Threats from flooding, storms, and wildfire may also potentially lead to housing shifts. An analysis of nationwide differences in home price appreciation between 2007 and 2017 found that there was a slight correlation between homes exposed to high wildfire, flooding, and hurricane surge risk and a decrease in house prices. Homes in high-risk areas are worth less than they were a decade earlier, indicating that people are starting to consider climate change impacts when buying houses, which may leave low-income populations behind in at-risk areas (Flavelle and McCartney 2018; Benz and Burney 2021). However, it is uncertain if this pattern will affect population or housing shifts in the San Diego region in a similar way.

4.14.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Federal Uniform Act

The Uniform Act (42 U.S. Code Part 24) establishes minimum standards for federally funded programs and projects that require the acquisition of real property (real estate) or displacement of persons from their homes, businesses, or farms. The Uniform Act's protections and assistance apply to the acquisition, rehabilitation, or demolition of real property for federal or federally funded projects. Federal Highway Administration (FHWA) regulations implementing the Uniform Act are found at 49 Code of Federal Regulations Part 24 (FHWA 1999).

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

State Housing Element Law

State law requires that each city and county prepare and adopt a general plan for its jurisdiction that contains certain mandatory elements, including a housing element. (General plan requirements are described in Section 4.11, *Land Use*.) The housing element is a comprehensive assessment of current and forecasted housing needs for all economic segments of the community. Among other things, housing elements must assess the jurisdiction's existing and forecasted housing needed, including the jurisdiction's fair share of regional housing needs identified in the Regional Housing Needs Assessment (RHNA). They also must identify adequate sites to meet the needs of households at all income levels (Government Code Sections 65580 et seq.).

California Relocation Assistance Act

The California Relocation Assistance Act (Government Code Section 7260 et seq.) establishes uniform policies to provide for the fair and equitable treatment of people displaced from their homes or businesses as a direct result of State and/or local government projects or programs. The California Relocation Assistance Act requires that comparable replacement housing be made available to displaced persons within a reasonable period of time prior to the displacement. Displaced persons or businesses are assured payment for their acquired property at fair market value. Relocation assistance in the form of advisory assistance and financial benefits would be provided at the local level. This includes aid in finding a new home location, payments to help cover moving costs, and additional payments for certain other costs.

Assembly Bill 1730 of 2019

Assembly Bill (AB) 1730 of 2019 requires the updated Regional Transportation Plan (RTP), SCS, and EIR adopted by SANDAG on October 9, 2015, to remain in effect for State compliance, funding eligibility, and other purposes until December 31, 2021, when SANDAG must adopt its next update to its regional transportation plan. The bill provides that an interim update to the 2015 RTP adopted by SANDAG for purposes of compliance with certain federal laws (i.e., the 2019 Federal RTP) shall not constitute a project for the purposes of CEQA, thereby exempting it from CEQA. The bill also requires SANDAG to submit an implementation report to California Air Resources Board (CARB) when it submits an SCS for review.

The Sustainable Communities and Climate Protection Act of 2008 (Senate Bill 375)

The Sustainable Communities and Climate Protection Act of 2008 (Senate Bill [SB] 375, Chapter 728, Statutes of 2008) requires, in part, the preparation of a Sustainable Communities Strategy (SCS) as part of the Regional

Transportation Plan (RTP). Among other things, the SCS must identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the RTP, taking into account net migration into the region, population growth, household formation, and employment growth (Government Code Section 65080). The proposed Plan includes the SCS for the San Diego region that complies with these requirements.

Under SB 375, preparation of the RHNA is coordinated with preparation of the SCS. The RHNA must allocate housing units consistent with the SCS development pattern (Government Code Section 65584.04(m)). As discussed above, in 2019, AB 1730 extended the period of time for SANDAG to complete the update to its 2015 Regional Plan. That bill also provided that the consistency determination required by Government Code Section 65584.04(m) could be satisfied by demonstrating consistency between the RHNA and the development pattern in the 2015 SCS (Government Code Section 65584.045).

Jobs and Economic Improvement Through Environmental Leadership Act of 2021 (Senate Bill 7)

On May 20, 2021, Governor Gavin Newsom signed into law SB 7, which extends expedited CEQA judicial review for small-scale housing developments. In 2011, AB 900 created an expedited judicial review process under CEQA for large, multi-benefit housing, clean energy, and manufacturing projects, provided that they met certain requirements, including provisions related to labor. SB 7 extends the provisions of AB 900 through the year 2025, and lowers the threshold for eligible housing projects. SB 7 provides benefits to projects that were previously certified under AB 900 but that did not receive project approvals by the prior deadline of January 1, 2021, and marks the first bill of the Senate's 2021 "housing package" that targets California's ongoing housing crisis, with an emphasis on minimization of greenhouse gases and boosting employment opportunities.

SB 7 reenacts AB 900 and adds: (1) eligibility for infill housing development projects with investments between $15 and $100 million (the previous threshold was $100 million and above); (2) a requirement of quantification and mitigation of the impacts of a project from the emissions of greenhouse gases *with* geographic restrictions for non-housing development projects; (3) a revision of labor-related requirements for projects undertaken by both public agencies and private entities, adding "skilled and trained" workforce to the existing prevailing wage requirements; and (4) authorization for the Governor to certify a project before the lead agency certifies the final EIR for the project and/or an alternative described in an EIR. SB 7 requires an applicant for certification of a project to (1) demonstrate that they are preparing the administrative record concurrently with the administrative process; and (2) agree to pay the costs of both the trial court and court of appeal in hearing and deciding a case challenging a lead agency's action on a certified project.

Duplex Zoning Law (Senate Bill 9)

On September 16, 2021, Governor Gavin Newsom signed into law Senate Bill 9, which requires, for qualifying parcels, ministerial approval of two-unit housing developments in single-family zoning districts, and would allow single-family parcels to be subdivided into two lots. Taken together, these provisions could allow for development of up to four housing units on lots where only one unit is currently permitted. SB 9 requires applicants for lot splits under this law to confirm that they intend to occupy one of the housing units as their principal residence for a minimum of 3 years, unless the applicant is a community land trust or qualified nonprofit corporation. Under SB 9, a local agency retains discretion to deny a proposed housing project if it finds that the project would have an adverse health and safety or environmental impact that cannot be feasibly mitigated or avoided. Local agencies are also required to prohibit use of the units for short-term rentals of 30 days or less.

CEQA Streamlining for Upzoning (Senate Bill 10)

Signed into law by Governor Newsom on September 16, 2021, SB 10 allows, but does not require, local agencies to avoid CEQA review when upzoning parcels to allow up to 10 units per parcel, at a height specified by local ordinance, if the parcel is located in a qualifying transit-rich area or an urban infill site. SB 10 does not provide new CEQA exemptions or streamlining for the projects that would be constructed on these upzoned parcels, but, under existing law, certain CEQA exemptions or streamlining may be available on a case-by-case basis depending on project size, site conditions and other factors. However, for larger residential or mixed-use projects with more than 10 units developed on one or more parcels upzoned pursuant to SB 10, the bill prohibits those projects from being approved ministerially or by right, or from being exempt from CEQA, with limited exceptions.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

Regional Housing Needs Assessment

State law requires the California Department of Housing and Community Development (HCD) to determine each region's housing need in an RHNA, and requires regions such as SANDAG to adopt a regional housing needs allocation plan (Government Code Sections 65584(a),(b)). The intention of the RHNA process is to create a better balance of jobs and housing in communities, ensure the availability of decent affordable housing for all income groups, and achieve sustainability through long-term strategic land use planning. In July 2020, the SANDAG Board of Directors adopted the RHNA Plan, which allocates housing units to jurisdictions based on each jurisdiction's share of transit and jobs within the region. It also includes an equity adjustment allocating a lower proportion of housing need to an income category when a jurisdiction already has a disproportionately high share of households in that income category compared to the regional share (SANDAG 2021c). The RHNA for the sixth housing element cycle has two main components:

- **RHNA Determination** – HCD determination of the regionwide housing units needed during the housing element cycle
- **RHNA Plan** – The SANDAG plan to allocate the RHNA Determination housing units to each local jurisdiction by four income categories

In July 2018, SANDAG received the RHNA Determination from HCD, requiring that the region plan for 171,685 housing units during the sixth housing element cycle, which covers the years 2021 through 2029. The housing units are divided into four income categories shown in Table 4.14-5 below.

Table 4.14-5
Housing Unit Needs in the San Diego Region-Sixth Housing Element Cycle (2021-2029)

Income Category	Housing Unit Need	Percent
Very Low	42,332	24.70%
Low	26,627	15.50%
Moderate	29,734	17.30%
Above Moderate	72,992	42.50%
Total Housing Units	171,685	100%

Source: SANDAG 2021c.

As work continued on the 2021 Regional Plan, the RHNA Plan informed development of the SCS land use pattern, setting forth a forecasted development pattern for the region. The SCS land use pattern identifies areas within the region sufficient to house the projection of regional housing need determined by the HCD, includes housing unit assumptions for each jurisdiction that meet the housing unit allocations in the RHNA Plan, and prioritizes Mobility Hub areas and Smart Growth Opportunity Areas for future development.

Housing Elements of Local Jurisdictions

Each city and the County has developed and must periodically update a housing element as part of its general plan per requirements of the State Housing Element Law. The RHNA Plan allocates housing needs in the four income categories to each of the cities and county to use in their housing element updates. The housing element is a comprehensive assessment of current and forecasted housing needs for all economic segments of the community. It includes an inventory of land suitable for residential development, and a zoning analysis to demonstrate the jurisdiction's ability to accommodate its housing unit allocation; it also sets forth local housing policies and programs to implement those policies. The cities and County are required to update their housing elements to include RHNA Plan allocations every 8 years; updates can be required every 4 years if updated housing elements are not adopted by certain deadlines. Many jurisdictions in the region are in their 6th cycle of housing element updates.

Land Use Elements of Local Jurisdictions

Each local city and the County has developed a land use element as part of its general plan per requirements of State Planning and Zoning Law (Government Code Sections 65000 et seq.). The land use element designates the general location and intensity of housing, business, industry, open space, education, public buildings and grounds, waste disposal facilities, and other land uses.

Local Coastal Programs of Local Jurisdictions

Local jurisdictions within the Coastal Zone may prepare a Local Coastal Program (LCP) for approval by the Coastal Commission. LCPs implement the goals, policies, and requirements of the Coastal Act, including those pertaining to housing, within a local jurisdiction.

4.14.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the CEQA Guidelines Appendix G checklist questions. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, and the unique characteristics of the proposed Plan.

Checklist questions for population and housing are provided in Section XII of CEQA Guidelines Appendix G. To better focus the potential impacts associated with the proposed Plan, the CEQA Guidelines Appendix G questions have been combined and modified. Specifically, criteria (b) and (c) are combined since criteria (b) and (c) in CEQA Guidelines Appendix G relate to displacement of a substantial number of existing housing units and displacement of a substantial number of people. These two questions have been combined in this document (POP-2) because both focus on the need for construction of replacement housing as a result of substantial displacement. Therefore, implementation of the proposed Plan would have a significant population and housing impact if it would:

POP-1	Induce substantial unplanned population growth to areas of the region either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., by extending roads and other infrastructure).
POP-2	Displace substantial numbers of people or housing units, which would necessitate the construction of replacement housing elsewhere.

4.14.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

POP-1 INDUCE SUBSTANTIAL UNPLANNED POPULATION GROWTH TO AREAS OF THE REGION EITHER DIRECTLY (E.G. BY PROPOSING NEW HOMES AND BUSINESSES) OR INDIRECTLY (E.G., BY EXTENDING ROADS AND OTHER INFRASTRUCTURE)

ANALYSIS METHODOLOGY

This section analyzes whether substantial increases in unplanned population growth would be induced by the proposed Plan based on the Series 14 Regional Growth Forecast and proposed transportation network improvements and programs. Growth inducement is discussed further in Chapter 7, *Other Considerations Required by CEQA*. The secondary impacts of induced population growth are the physical changes to the environment already analyzed in the other resource area sections of this EIR (Sections 4.1 through 4.19); therefore, they are not addressed in this section.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, the region is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). The 2025 regional SCS land use pattern is shown in Figure 2-17. Approximately 79 percent of the forecasted regional population increase between 2016 and 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent). Those same three jurisdictions accommodate approximately 78 percent of new housing units in the region between 2016 and 2025, while the City of San Diego, National City, and the City of Chula Vista accommodate more than 70 percent of new jobs in the region between 2016 and 2025.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are Downtown, Mission Valley, Midway-Pacific Highway, and University Center. The highest proportions of forecasted job increases are in the communities of Downtown, University Center, Otay Mesa, and Kearny Mesa. In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases are Otay and North County Metro. The only significant increase in jobs over that period is in East Otay Mesa.

New development caused by regional growth and land use change would be in the form of new homes, services, commercial areas, industrial centers, schools, and civic uses. Additionally, the proposed Plan forecasts a general intensification of existing land uses within urban communities and along key transportation corridors. The land use components of the proposed Plan would induce substantial population increases in the specific locations described above through policies and strategies that provide for the development of new housing units, job-supporting nonresidential land uses, and related improvements to public facilities and infrastructure.

As discussed above, Government Code Section 65080(b)(2)(B)(ii) requires that the RTP/SCS must accommodate all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan. In accordance with requirement, the projected housing mix would help the region accommodate the projected housing needs over the life of the proposed Plan, especially housing at the lower income categories.

As mandated by State Housing Law as part of the periodic (every 8 years) process of updating local housing elements of the General Plan, SANDAG is responsible for the allocation of regional housing need to jurisdictions in the region. As discussed in Section 4.14.2, *Regulatory Setting*, SANDAG developed its 6th cycle RHNA Allocation Plan, and received the RHNA Determination from HCD in July 2018. As work continued on the 2021 Regional Plan, the RHNA Plan informed development of the SCS land use pattern, setting forth a forecasted development pattern for the region. As discussed above, local jurisdictions are required to plan and zone to accommodate their respective RHNA allocation (housing units). Communities may use the RHNA in land use planning, prioritizing local resource allocation, and in deciding how to address identified existing and future housing needs resulting from population, employment, and household growth.

Implementation of the proposed Plan's land use development pattern would accommodate 8 percent of the region's future housing growth and 7 percent of the future employment growth in 2025 while keeping jurisdictional totals consistent with local input. It moves the region towards more compact, mixed-use development with a variety of housing types leading to more opportunities for walking and biking, more transit use, and shorter auto trips. Due to the proposed Plan's land use strategies that focus on concentrated development in the urban centers and mobility hubs, there is potential to induce growth in some areas of the region, although overall the proposed Plan accommodates anticipated growth rather than inducing growth. Generally, most jurisdictions have started planning for this increase in density in urban areas, and the proposed Plan builds on local input. However, there remains the potential for the proposed Plan's strategies to influence population growth in areas where local general plans have not yet been updated to reflect such growth. Therefore, implementation of the proposed Plan would have the potential to induce unplanned growth in some areas of the region resulting in a significant impact.

Transportation Network Improvements and Programs

Most transportation network improvements from 2016 to 2025 are additions to existing highways, rail corridors, or local roads located in established communities, such as the addition of managed lanes along Interstate (I-) 5 through the coastal cities of Encinitas, Carlsbad, and Oceanside; and the addition of new toll lanes on State Route (SR) 11 to the Otay Mesa East Port of Entry (POE). Other planned network improvements include active transportation projects and improvements to regional arterials, which occur along or within existing transportation alignments. Major improvements also include double-tracking at certain locations on the Los Angeles–San Diego–San Luis Obispo (LOSSAN) Rail Corridor and the station addition in the Gaslamp Quarter in downtown San Diego. The proposed Plan also includes new infrastructure as part of the Mobility Hubs development, consisting of parking, electric vehicle charging stations, travel kiosks, passenger loading zones, parcel delivery lockers, and carshare parking.

The planned network improvements and programs would help facilitate movement of people and goods and accessibility to improve the quality of life and sustain the economy as the region grows. The transportation network improvements and programs emphasize more efficient use of the existing highway and arterial networks and an enhanced transit network that would facilitate greater mobility between communities and employment or commercial centers within the region. Enhanced mobility would support forecasted regional growth by increasing the accessibility to and from areas of the region that are forecasted to increase housing

and/or employment development. In areas where transit improvements are implemented in addition to roadway improvements, greater intensity of growth would be accommodated. Transportation strategies included in the proposed Plan such as Mobility Hubs would support increased density in existing urban areas by facilitating travel and would not be expected to induce population growth as these projects are growth accommodating and generally are aimed at improving the existing transportation networks. Transportation projects such as new and expanded commuter rail projects, while not adding new homes or businesses directly, have the potential to create demand for new development around transit stations. However, many communities foresee these types of development, and plan for them accordingly.

Additionally, the integrated transportation investments and land use strategies in the proposed Plan would influence economic (jobs) and household growth in some areas and could remove some obstacles to growth in other parts of the region. Specifically, improved accessibility and connectivity potentially gained from transportation investments in the proposed Plan could facilitate population and economic growth in areas of the region that are currently not developed or underdeveloped. Therefore, implementation of the proposed Plan in 2025 would indirectly induce unplanned growth in some areas of the San Diego region, resulting in a significant impact.

2025 Conclusion

Implementation of the regional growth and land use change, as well as transportation network improvements would induce unplanned growth in some areas of the San Diego region. Therefore, this impact (POP-1) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, the region is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). The 2035 regional SCS land use pattern is shown in Figure 2-18. Approximately 80 percent of the forecasted regional population increase between 2026 and 2035 is in the City of San Diego (71 percent), National City (7 percent), La Mesa (3.8 percent), and Escondido (3.2 percent). Similarly, these four jurisdictions accommodate approximately 76 percent of new housing units and 70 percent of new jobs between 2026 and 2035.

Implementation of the proposed Plan's land use development pattern would accommodate 9 percent of the region's future total housing growth and 9 percent of the future total employment growth in 2025 while keeping jurisdictional totals consistent with local input. Similar to the 2025 analysis, regional growth and development in the region would be more compact, mixed-use development with a variety of housing types leading to more opportunities for walking and biking, more transit use, and shorter auto trips. Due to the proposed Plan's land use strategies that focus on concentrated development in the urban centers and mobility hubs, there is potential to induce growth in some areas of the region, although overall the proposed Plan accommodates anticipated growth rather than inducing growth. However, there remains the potential for the proposed Plan's strategies to influence population growth in areas where local general plans have not yet been updated to reflect such growth. Therefore, implementation of the proposed Plan would have the potential to induce unplanned growth in some areas of the region resulting in a significant impact,

Transportation Network Improvements and Programs

In 2035, most transportation network improvements would affect existing transportation facilities, such as SPRINTER rail corridor double-tracking; Blue, Orange, and Green Trolley line station enhancements; rail grade separations; additional managed lanes and conversion of general purpose lanes and shoulders to managed lanes along existing freeways and highways; improvements to regional arterials; and active transportation projects.

Other planned transportation network improvements would occur in highly developed established communities. This includes the development of Mobility Hubs such as the Central Mobility Hub and the San Ysidro Mobility Hub, and the rail extensions including Commuter Rail 398, from Oceanside to downtown San Diego and Commuter Rail 582, from Sorrento Mesa to National City via UTC, Kearny Mesa, and either University Heights or City Heights. These improvements would help accommodate population, housing, and job growth forecasted for the region. Increases in alternative transportation services would also accommodate forecasted growth in the region.

The planned network improvements and programs would help facilitate movement of people and goods and accessibility to improve the quality of life and sustain the economy as the region grows. The transportation network improvements and programs emphasize more efficient use of the existing highway and arterial networks and an enhanced transit network that would facilitate greater mobility between communities and employment or commercial centers within the region. Enhanced mobility would support forecasted regional growth by increasing the accessibility to and from areas of the region that are forecasted to increase housing and/or employment development. Transportation strategies included in the proposed Plan such as Mobility Hubs would support increased density in existing urban areas by facilitating travel and would not be expected to induce population growth as these projects are growth accommodating and generally are aimed at improving the existing transportation networks. Transportation projects such as new and expanded commuter rail projects, while not adding new homes or businesses directly, have the potential to create demand for new development around transit stations. However, many communities foresee these types of development, and plan for them accordingly.

Additionally, the integrated transportation investments and land use strategies in the proposed Plan would influence economic (jobs) and household growth in some areas, such as the Central Mobility Hub and San Ysidro Mobility Hub, and could remove some obstacles to growth in other parts of the region. Specifically, improved accessibility and connectivity potentially gained from transportation investments in the proposed Plan could facilitate population and economic growth in areas of the region that are currently not developed or underdeveloped. Therefore, implementation of the proposed Plan in 2035 would indirectly induce unplanned growth in some areas of the San Diego region, resulting in a significant impact.

2035 Conclusion

Implementation of the regional growth and land use change, as well as transportation network improvements would induce unplanned growth in some areas of the San Diego region. Therefore, this impact (POP-1) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, the region is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent). The 2050 regional SCS land use pattern is shown in Figure 2-19. Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), San Marcos (13 percent), and City of Chula Vista (28 percent). Similarly, these three jurisdictions are forecasted to accommodate approximately 89 percent of new housing units and 72 percent of new jobs between 2036 and 2050.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases are the Downtown, Midway Pacific Highway, and Uptown. The highest proportions of forecasted job increases are in the communities of Downtown, Otay Mesa, Kearny Mesa, and University Center. In the unincorporated County, the communities with the highest proportion of forecasted population increases are Lakeside, North County Metro, and Valle de Oro. There are no housing units forecasted in the unincorporated area after 2035 in the SCS land use pattern. The only significant increase in jobs over this period is in East Otay Mesa.

Implementation of the proposed Plan's land use development pattern would accommodate 4 percent of the region's future housing growth and 8 percent of the future employment growth in 2050, while keeping jurisdictional totals consistent with local input. As stated in the 2025 analysis, the proposed Plan moves the region towards more compact, mixed-use development with a variety of housing types leading to more opportunities for walking and biking, more transit use, and shorter auto trips. Due to the proposed Plan's land use strategies that focus on concentrated development in the urban centers and mobility hubs, there is potential to induce growth in some areas of the region, although overall the proposed Plan accommodates anticipated growth rather than inducing growth. Generally, most jurisdictions have started planning for this increase in density in urban areas, and the proposed Plan builds on local input. However, there remains the potential for the proposed Plan's strategies to influence population growth in areas where local general plans have not yet been updated to reflect such growth. Therefore, implementation of the proposed Plan would have the potential to induce unplanned growth in some areas of the region resulting in a significant impact,

Transportation Network Improvements and Programs

Between 2036 and 2050, most transportation network improvements would affect existing transportation facilities; these improvements include the Blue, Orange, and Green Trolley line station enhancements; rail grade separations; additional managed lanes and conversion of general purpose lanes and shoulders to managed lanes along existing freeways and highways; improvements to regional arterials; and active transportation projects.

Other planned transportation network improvements would occur in highly developed established communities. This includes the Commuter Rail 581 extension from downtown to El Cajon and from the Central Mobility Hub to El Cajon, the Commuter Rail 582 extension from National City to the U.S. Border, the Commuter Rail 583 extension from the Central Mobility Hub to the U.S. Border via downtown San Diego, the Commuter Rail 398 extension from Oceanside to downtown San Diego, and the SPRINTER extension to North County Fair.

As discussed above, the location and timing of transportation network improvements and programs identified in the proposed Plan would accommodate forecasted regional growth in population in the specific locations

described in this section where the development of new housing units and jobs-supporting nonresidential land uses would occur.

The planned network improvements and programs would help facilitate movement of people and goods and accessibility to improve the quality of life and sustain the economy as the region grows. The transportation network improvements and programs emphasize more efficient use of the existing highway and arterial networks, and an enhanced transit network that would facilitate greater mobility between communities and employment or commercial centers within the region. Enhanced mobility would support forecasted regional growth by increasing the accessibility to and from areas of the region that are forecasted to increase housing and/or employment development. In areas where transit improvements are implemented in addition to roadway improvements, greater intensity of growth can be accommodated. Specifically, improved accessibility and connectivity potentially gained from transportation investments in the proposed Plan could facilitate population and economic growth in areas of the region that are currently not developed or underdeveloped. Therefore, implementation of the proposed Plan in 2050 would indirectly induce unplanned growth in some areas of the San Diego region, resulting in a significant impact.

2050 Conclusion

Implementation of the regional growth and land use change, as well as transportation network improvements would induce unplanned growth in some areas of the San Diego region. Therefore, this impact (POP-1) in the year 2050 is significant.

Exacerbation of Climate Change Effects

The proposed Plan could potentially exacerbate climate change effects on populations living in areas that may experience unplanned growth. Due to the proposed Plan's land use strategies that focus on concentrated development in the urban centers and mobility hubs (including near transportation improvements), there is a potential to induce growth in some areas of the region. If additional infill development occurs to accommodate unplanned population growth without climate mitigation strategies (i.e., vegetation, shading, cool roofs, etc.), those areas will be vulnerable to high temperatures, as further described in Section 4.14.1, *Existing Conditions*.

Furthermore, although the proposed Plan accommodates anticipated growth rather than inducing growth overall, there is the potential for some unplanned induced population growth, and subsequent development. If unplanned population growth results in increased housing and businesses in climate vulnerable areas (potentially due to lower real estate values), the population in these areas may be more at risk for impacts related to sea-level rise, flooding, and wildfires, depending on the location.

MITIGATION MEASURES

POP-1 INDUCE SUBSTANTIAL UNPLANNED POPULATION GROWTH TO AREAS OF THE REGION EITHER DIRECTLY (E.G. BY PROPOSING NEW HOMES AND BUSINESSES) OR INDIRECTLY (E.G., BY EXTENDING ROADS AND OTHER INFRASTRUCTURE)

2025, 2035, and 2050

SANDAG has no control over the amount or exact location of growth the region would experience during the implementation of the proposed Plan. The regional growth and land use change forecasted in the proposed Plan would be implemented by local jurisdictions through local plans and individual development projects, and most transportation network improvements would be implemented by transportation project sponsors other

than SANDAG. The proposed Plan has been developed to accommodate forecasted regional growth and failing to do so would be inconsistent with the federal and State requirements for RTPs. In addition, precluding growth would conflict with the requirements to provide sufficient housing for the region's population contained in SB 375. As discussed in Section 4.14.2, Government Code Section 65080(b)(2)(B)(ii) requires that the RTP/SCS must house all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan. As such, there is no feasible mitigation.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Based on the discussion above, impacts related to induced substantial increases in population under the proposed Plan would be significant and unavoidable.

POP-2 DISPLACE SUBSTANTIAL NUMBERS OF PEOPLE OR HOUSING UNITS, WHICH WOULD NECESSITATE THE CONSTRUCTION OF REPLACEMENT HOUSING ELSEWHERE

ANALYSIS METHODOLOGY

This analysis examines whether forecasted regional growth and land use change and planned transportation network improvements would physically displace a substantial number of people or housing units, necessitating the construction of replacement housing elsewhere. The significance of the impact is determined by the degree to which new housing units are needed elsewhere, the construction of which would have the potential to result in a significant physical impact on the environment. Because the degree to which displacement occurs is based on a variety of factors, such as details of actual development project proposals, economic factors including land costs, and other inputs, the analysis does not quantify numbers of people or housing units that would be displaced but instead focuses on the potential for substantial displacement to occur with implementation of the proposed Plan.

For regional growth, the impact analysis section analyzes forecasted development patterns throughout the region as represented in the proposed Plan, including new growth in existing urbanized areas. The regional growth and land use changes forecasted for each horizon year are used to describe how the proposed Plan may shape future development patterns that, as a consequence of the proposed Plan's implementation, would result in the construction of replacement housing elsewhere to offset the displacement of people and housing that could occur under the proposed Plan. The analysis includes a comparison of maps of existing and forecasted population and housing density for each horizon year. In addition, a qualitative discussion is provided to describe how the forecasted growth and land use changes under the proposed Plan may affect the affordable housing stock.

For transportation improvements, the analysis describes how transportation projects may require new right-of-way (ROW) acquisitions that contribute to the physical displacement of people and housing units. Geographic information systems (GIS) were used to analyze where major freeway, rail, and transit projects, such as those described above, would intersect areas used for residential development. A 500-foot potential impact zone was drawn around the freeway, rail, and transit projects in the proposed Plan Area to compute the number of acres that could potentially be affected by the construction and operation of major transportation projects under the proposed Plan. Table 4.14-6 shows the results of the analysis with the potential acreage of these affected areas within the region.

Displacement of housing was assessed by evaluating the location of major transportation projects in relation to surrounding land uses and community development. Highway and transit/rail extensions and major interchange projects were assumed to have a higher potential to result in the physical displacement of people and housing units because they would involve the creation of new roadways. Highway widening and other projects along established transportation ROWs were assumed to have a lower potential to physically displace people and housing units.

Table 4.14-6
Potential Displacement of Existing Residential and Commercial Land Uses (in acres)

Land Use	2025	2035	2050
Developed	3,127	23,787	23,239
Agriculture	98	282	867
Commercial and Office	354	2,012	1,455
Education and Institutions	122	841	718
Heavy and Light Industry	412	1,844	1,141
Military	0	337	1,243
Mixed Use	291	877	746
Mobile Homes	115	318	185
Multi-Family Residential	182	1,276	1,071
Open Space Parks	20	41	89
Recreation	186	1,053	995
Single Family Residential	443	3,273	2,828
Transportation, Communications, Utilities	896	11,597	11,831
Under Construction	7	37	71
Spaced Rural Residential	65	202	327
Open Space Parks	534	2,917	3,154
Vacant	248	739	1,200
Water	72	278	140
Total	4,046	27,924	28,060

Source: SANDAG 2021a.

Transportation improvements that would potentially occur under the proposed Plan for each horizon year are compared with the existing transportation facilities and existing development (i.e., population and housing locations) to determine if implementation of the proposed Plan would necessitate the construction of replacement housing elsewhere. Similar to the analysis for regional growth, a qualitative discussion is provided to describe how the transportation network improvements under the proposed Plan may affect the affordable housing stock.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Regional displacement is addressed under SB 375, which requires that the SCS identify sufficient areas in the region to house all the projected population. The proposed Plan's housing allocations are based on the regional growth forecast, which identifies how much the San Diego region might grow between the proposed Plan's baseline year (2016) and its horizon year (2050), including population, jobs, and associated housing units. As previously stated, the SCS land use pattern primarily allocates population, jobs, and housing units to areas in the region known as Mobility Hubs, which are areas anticipated for concentrated future development. Mobility Hubs overlap with areas already identified by local jurisdictions for increased density, such as Smart Growth Opportunity Areas and transit priority areas. The projected land use strategy would accommodate 288,216 total housing units and 1,761,747 total jobs by 2025, which would be consistent with population and employment growth projections in the San Diego region. Additionally, the SCS land use pattern identifies sufficient areas within the region to house the 6th Cycle RHNA Plan allocations. Therefore, an adequate number of residential units are planned for in the proposed Plan to meet the forecasted demand, taking into account localized displacement of some households within the region.

However, in some areas, such as the cities of San Diego, Chula Vista and Escondido, where much of the housing and job growth is projected to occur, the intensification of development forecasted for 2025 could lead to the redevelopment of existing properties containing lower-density residential uses. This can result in physical effects both directly and indirectly. New development would occur at higher densities and with more modern housing, frequently as part of a mixed-use development. The potential for direct displacement effects would result from projected growth occurring at the site of existing residential units. For instance, redevelopment of existing housing sites could result in displacement of current residents, which may necessitate construction of replacement housing, resulting in direct impacts. Thus, existing structures could be replaced with higher-density housing and/or mixed-use commercial structures, and lead to substantial displacement of people and housing units, necessitating the construction of replacement housing elsewhere.

Regional growth and land use changes have the potential to affect the availability of affordable housing in the region. The redevelopment of existing properties containing lower-density residential uses is likely to occur in communities that include the region's affordable housing stock. Non-deed restricted affordable housing units could be redeveloped into market rate housing, potentially displacing residents. The RHNA includes a methodology to distribute the regional housing in a manner that allocates more housing units for low- and very low–income residents in places where this type of housing has not been available in the past. The RHNA makes low-income housing a priority in high-opportunity areas that feature better schools, more economic opportunity, and fewer environmental hazards. As part of the proposed Plan, SANDAG has begun developing a housing incentive program to support jurisdictions as they develop and adopt policies and process improvements to accelerate the development of housing in areas with access to transit, jobs, and other amenities. However, it cannot be guaranteed that the planned housing incentives would avoid potential conflicts with the loss of affordable housing in the region, necessitating the construction of replacement housing elsewhere. The displacement of existing affordable housing stock resulting in replacement elsewhere would be a significant impact.

Existing laws are in place to provide assistance to relocated households and businesses. As described in Section 4.14.2, the Federal Uniform Act and California Relocation Assistance Act, public agencies must provide

relocation assistance when an action by the agency displaces residences. Construction of replacement housing outside the region would, however, be unlikely, as adopted land use plans have sufficient capacity to accommodate forecasted population and housing growth.

Transportation Network Improvements and Programs

Most transportation network improvements from 2016 to 2025 are additions to existing highways, rail corridors, or local roads located in established communities, such as the addition of managed lanes along Interstate (I-) 5 through the coastal cities of Encinitas, Carlsbad, and Oceanside; and the addition of new toll lanes on State Route (SR) 11 to the Otay Mesa East Port of Entry (POE). Other planned network improvements include active transportation projects and improvements to regional arterials, which occur along or within existing transportation alignments. Major improvements also include double-tracking at certain locations on the Los Angeles–San Diego–San Luis Obispo (LOSSAN) Rail Corridor and the station addition in the Gaslamp Quarter in downtown San Diego. The proposed Plan also includes new infrastructure as part of the Mobility Hubs development consisting of parking, electric vehicle charging stations, travel kiosks, passenger loading zones, parcel delivery lockers, and carshare parking.

As shown in Table 4.13-6 above, approximately 805 acres of residential land uses would be affected by the planned transportation improvements in 2025. Therefore, transportation network improvements could displace substantial numbers of existing housing, which would necessitate the construction of replacement housing elsewhere. Transportation network improvements would have a significant impact.

2025 Conclusion

Between 2016 and 2025, regional growth and land use change, as well as transportation network improvements, would have the potential to displace a substantial number of people and housing units, necessitating the construction of replacement housing elsewhere. Therefore, this impact (POP-2) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

The projected land use strategy in 2035 would accommodate 121,650 total housing units and 1,921,475 total jobs between 2026 and 2035, which would be consistent with population and employment growth projections in the San Diego region. As stated in the 2025 analysis, the SCS land use growth pattern indicates there would be an adequate number of residential units planned to meet the forecasted demand, taking into account localized displacement of some households within the region.

Existing laws are in place to provide assistance to relocated households and businesses. As described in Section 4.14.2, under the Federal Uniform Act and California Relocation Assistance Act, public agencies must provide relocation assistance when an action by the agency displaces residences. Construction of replacement housing outside the region would, however, be unlikely, as adopted land use plans have sufficient capacity to accommodate forecasted population and housing growth.

Similar to the discussion in 2025, the intensification of development forecasted between 2026 and 2035 could lead to the redevelopment of existing properties containing lower-density residential uses. Existing structures would be replaced with higher-density housing and/or mixed-use commercial structures, leading to substantial displacement of people or housing units, including the affordable housing stock, necessitating the

construction of replacement housing elsewhere. Thus, regional growth and land use change could cause the displacement of a substantial number of people and housing units, necessitating the construction of replacement housing elsewhere, a significant impact.

Transportation Network Improvements and Programs

In 2035, most transportation network improvements would affect existing transportation facilities, such as SPRINTER rail corridor double-tracking; Blue, Orange, and Green Trolley line station enhancements; rail grade separations; additional managed lanes and conversion of general purpose lanes and shoulders to managed lanes along existing freeways and highways; improvements to regional arterials; and active transportation projects. While portions of these improvements to existing transportation facilities would likely involve temporary and permanent ROW acquisition, they are unlikely to involve acquisitions of property that would displace substantial numbers of people or housing units.

Other planned transportation network improvements would require acquisition of new ROWs in highly developed established communities. This includes the development of Mobility Hubs such as the Central Mobility Hub and the San Ysidro Mobility Hub, and the rail extensions including Commuter Rail 398, from Oceanside to downtown San Diego and Commuter Rail 582, from Sorrento Mesa to National City via UTC, Kearny Mesa, and either University Heights or City Heights. The future alignments and engineering designs for these rail extensions have not yet been determined, but are likely to be located, to the extent feasible, within existing public ROWs such as along existing freeways, roadways, and rail corridors in order to minimize costs associated with property acquisition and reduce impacts on owners of private property, including businesses and residents. Planning studies for the Central Mobility Hub are currently underway, and the project would likely result in temporary and permanent ROW acquisitions.

It cannot be guaranteed that all segments of these future rail extensions would avoid acquisition of properties that would result in substantial displacement of people or housing units. Individual transportation network improvements, including the planned commuter rail extensions and development of the Mobility Hubs, would undergo separate environmental review under CEQA and NEPA where applicable. The corresponding project-specific environmental documentation would identify significant impacts with regard to displacement of people or housing units, and identify mitigation measures to avoid or lessen the substantial displacement of people or housing units. Existing laws are in place to provide assistance to relocated households and businesses. As described in Section 4.14.2, the Federal Uniform Act and California Relocation Assistance Act require public agencies to provide relocation assistance when an action by the agency displaces residences or businesses. Construction of replacement housing outside the region would be unlikely as adopted land use plans have sufficient capacity to accommodate forecasted population housing growth. Nevertheless, it cannot be concluded that all project-level displacement of people or housing units associated with planned commuter rail extensions would be avoided or substantially lessened.

As shown in Table 4.13-6 above, a total of 5,069 acres of residential land uses could be affected by planned transportation improvements in 2035. Therefore, transportation network improvements could displace substantial numbers of existing housing which would necessitate the construction of replacement housing elsewhere. Transportation network improvements would have a significant impact.

2035 Conclusion

Between 2026 and 2035, development associated with regional growth and land use change and planned transportation network improvements could displace a substantial number of people and existing housing

units, necessitating the construction of replacement housing elsewhere. Therefore, this impact (POP-2) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

The projected land use strategy in 2050 would accommodate 61,433 total housing units and 2,086,318 total jobs between 2036 and 2050, which would be consistent with population and employment growth projections in the San Diego region. As stated in the 2025 and 2035 analyses, the SCS land use growth pattern indicates there is an adequate number of residential units to meet the forecasted demand, taking into account localized displacement of some households within the region. Thus, implementation of the proposed Plan would not result in displacement at the regional scale, and impacts at the regional level would be less than significant.

Existing laws are in place to provide assistance to relocated households and businesses. As described in Section 4.14.2, under the Federal Uniform Act and California Relocation Assistance Act, public agencies must provide relocation assistance when an action by the agency displaces residences. Construction of replacement housing outside the region would, however, be unlikely, as adopted land use plans have sufficient capacity to accommodate forecasted population and housing growth.

Similar to the discussion in 2025 and 2035, the intensification of development forecasted for 2050 would lead to the redevelopment of existing properties containing lower-density residential uses. Existing structures would be replaced with higher-density housing or commercial structures, and would lead to substantial displacement of people or housing units necessitating the construction of replacement housing elsewhere. Thus, regional growth and land use change could cause the displacement of a substantial number of people and housing units, necessitating the construction of replacement housing elsewhere, a significant impact.

Transportation Network Improvements and Programs

Between 2036 and 2050, most transportation network improvements would affect existing transportation facilities; these improvements include the Blue, Orange, and Green Trolley line station enhancements; rail grade separations; new street car alignment, additional managed lanes and conversion of general purpose lanes and shoulders to managed lanes along existing freeways and highways; improvements to regional arterials; and active transportation projects. While portions of these improvements to existing transportation facilities would likely involve temporary or permanent ROW acquisition adjacent to existing facilities, the improvements to existing facilities or within existing public ROWs would not physically divide established communities. Increases in transit service frequencies along existing rail corridors, highways, and roadways would not physically divide an established community and are not addressed further in this section. The planned rail grade separation along the Blue, Orange, and Green Trolley lines would improve connections between communities currently physically divided by rail lines. While portions of these improvements to existing transportation facilities would likely involve temporary and permanent ROW acquisitions, they are unlikely to involve acquisitions of property that would displace substantial numbers of people or housing units.

Other planned transportation network improvements would require acquisition of new ROWs in highly developed established communities. This includes the Commuter Rail 581 extension from downtown to El Cajon and from the Central Mobility Hub to El Cajon, the Commuter Rail 582 extension from National City to the U.S. Border, the Commuter Rail 583 extension from the Central Mobility Hub to the U.S. Border via downtown San Diego, the Commuter Rail 398 extension from Oceanside to downtown San Diego, and the

SPRINTER extension to North County Fair. The future alignments and engineering designs for these rail extensions have not yet been determined, but are likely to be located, to the extent feasible, within existing public ROWs such as along existing freeways, roadways, and rail corridors in order to minimize costs associated with property acquisition and reduce impacts on owners of private property, including businesses and residents.

As discussed in the 2025 and 2035 analyses, it cannot be guaranteed that all segments of these future rail extensions would avoid acquisition of residential properties that would result in substantial displacement of people or housing units, including affordable housing units. Individual transportation network improvements, including the planned commuter rail extensions and development of the Mobility Hubs, would undergo separate environmental review under CEQA and NEPA where applicable. The corresponding project-specific environmental documentation would identify significant impacts with regard to displacement of people or housing units, including affordable housing, and identify mitigation measures to avoid or lessen the substantial displacement of people or housing units.

As described in Section 4.14.2, the Federal Uniform Act and California Relocation Assistance Act require public agencies to provide relocation assistance when an action by the agency displaces residences or businesses. Although existing laws are in place to provide assistance to relocated households and businesses, it cannot be concluded that all project-level displacement of people or housing units associated with planned commuter rail extensions and proposed new streetcars would be avoided or substantially lessened.

As shown in Table 4.13-6 above, a total of 4,411 acres of residential land uses could be affected by planned transportation improvements in 2050. Therefore, transportation network improvements could displace substantial numbers of existing housing which would necessitate the construction of replacement housing elsewhere. Transportation network improvements would have a significant impact.

2050 Conclusion

Between 2036 and 2050, development associated with regional growth and land use change and planned transportation network improvements could displace a substantial number of people and existing housing units, necessitating the construction of replacement housing elsewhere. Therefore, this impact (POP-2) in the year 2050 is significant.

Exacerbation of Climate Change Effects

The proposed Plan could potentially exacerbate climate change effects on the displacement of substantial numbers of people or housing units, especially for housing units near the coast. Due to climate change, homebuyers are spending less money on homes in areas with a high risk for flooding, storms, and wildfire risks, which is devaluing those homes; it is uncertain if this pattern will affect population or housing shifts in the San Diego region in a similar way or put lower-income populations in more at-risk areas. High temperatures may also make certain parts of the San Diego region more uncomfortable or more damaging to human health than others, possibly resulting in population or housing shifts. Because the proposed Plan is also expected to result in displacement of people and housing units, the proposed Plan could contribute even more to necessitating construction of replacement housing, exacerbating effects that the region is already expected to see under climate change.

MITIGATION MEASURES

POP-2 DISPLACE SUBSTANTIAL NUMBERS OF PEOPLE OR HOUSING UNITS, WHICH WOULD NECESSITATE THE CONSTRUCTION OF REPLACEMENT HOUSING ELSEWHERE

2025, 2035, and 2050

POP-2a Design Development Projects to Reduce Displacement. During planning, design, and project-level CEQA review of land development projects, the County of San Diego, cities, and other local jurisdictions can and should develop design strategies to avoid or reduce substantial displacement of people or housing units, including affordable housing units, where consistent with overall goals to promote housing growth, including the provision of affordable housing. For development projects that would displace people or housing units, alternative designs to retain existing housing on site, alternative project site locations, and provision of replacement housing as a mitigation measure can and should be evaluated. While displacement should be considered during project evaluations, avoidance or reduction of displacement should not be employed where it would undermine achievement of housing goals, including the development of transit-oriented development and the provision of affordable housing.

POP-2b Design Transportation Network Improvement Projects to Reduce Displacement. SANDAG shall, and other transportation project sponsors can and should, identify feasible project alignments during planning, design, and project-level CEQA review that avoid or reduce permanent property acquisitions that would result in the substantial displacement of people or housing units. Where avoidance is not feasible, measures to reduce substantial displacement should be considered including, but not limited to, the following:

- Selecting alignments within existing public ROWs.
- Designing sections above- or below-grade to avoid property acquisition that would cause displacement of people or housing units, including affordable housing.
- Selecting alignments within properties that result in the least amount of displacement. For example, acquiring vacant or undeveloped portions of property rather than portions occupied by housing units.
- Work with local jurisdictions to identify opportunities to develop housing as part of transportation projects.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of mitigation measure POP-2a and POP-2b would reduce substantial displacement of people and housing units. However, there is no guarantee that significant displacement impacts would be reduced to less-than-significant levels for all projects. Therefore, displacement resulting from regional growth and land use change and transportation network improvements is a significant and unavoidable impact of implementing the proposed Plan.

4.15 PUBLIC SERVICES AND UTILITIES

This section evaluates impacts on public services and utilities that would result from implementation of the proposed Plan. Impacts of the proposed Plan on the San Diego region's water supply and water infrastructure are discussed in Section 4.18, *Water Supply*. Impacts of the Proposed Plan related to wildfire are discussed in Section 4.19, *Wildfire*; therefore, in terms of fire, this section only addresses environmental impacts related to fire protection services facilities.

4.15.1 EXISTING CONDITIONS

This section describes the existing conditions associated with public services, which include fire protection, police protection, schools, libraries, and recreational facilities. It also describes the existing conditions associated with utilities, which include wastewater collection and treatment facilities, stormwater drainage facilities, telecommunications services, electricity and natural gas facilities, and solid waste disposal and recycling facilities.

PUBLIC SERVICES

Fire Protection

Structural and wildfire protection in the San Diego region is the responsibility of fire protection agencies at the federal, State, county, city, and community levels. Eighteen cities in the San Diego region have a fire department that is responsible for fire protection and prevention within their respective city limits. Fourteen Fire Protection Districts (FPDs), five County Service Areas, and the California Department of Forestry and Fire Protection (CAL FIRE) provide fire and emergency services to unincorporated San Diego County. Volunteer fire protection companies supported by the San Diego County Fire Authority provide emergency services for six areas in the unincorporated County where no fire protection agency is established (see Tables 4.15-1 and 4.15-2).

CAL FIRE is the principle contractor for fire protection services in the County of San Diego, and is responsible for wildfire protection of State Responsibility Areas within the County, which comprise over 50 percent of the unincorporated County's total land area (see Figure 4.19-1 in Section 4.19). CAL FIRE operates 18 stations within the County, including one air attack base in Ramona. CAL FIRE also operates an emergency response air program with both aircraft and helicopters, as needed (CAL FIRE 2017). CAL FIRE has instated a Resource Management Program to help protect California's natural resources and wildlands. Prevention programs are also run by CAL FIRE, such as vegetation management, risk analysis, and public education (CAL FIRE 2018).

The U.S. Forest Service (USFS) is responsible for fire protection and prevention on federal lands (Federal Responsibility Areas) and private lands within the Cleveland National Forest. There are 12 USFS fire stations in San Diego County. The Department of Defense provides fire protection on military installations but may request assistance from other agencies at the federal, State, or local levels if needed. Tribal governments provide their own fire protection but also may provide mutual air fire services to surrounding areas.

The Harbor Police Department of the San Diego Unified Port District are cross-trained as marine fire fighters. Their jurisdiction includes the San Diego Bay, San Diego International Airport, and the tidelands within the cities of San Diego, Chula Vista, National City, Imperial Beach, and Coronado.

Automatic and mutual aid agreements exist between many of the aforementioned agencies to provide necessary support for emergencies. Table 4.15-1 identifies agencies responsible for fire protection in the San Diego region's cities. Table 4.15-2 identifies agencies responsible for providing fire protection in the unincorporated areas of San Diego County. A small portion of the unincorporated County is not served by any FPD. Rather, these areas rely upon neighboring FPDs or CAL FIRE to respond to fires and emergencies. The agency that responds to fires and emergencies in unprotected areas is decided on a case-by-case basis (County of San Diego 2011).

Table 4.15-1
Fire Service Providers in the San Diego Region

City	Fire Service Provider	Number of Stations	Dispatch
City of Carlsbad	Carlsbad Fire Department	6	North County JPA
City of Chula Vista	Chula Vista Fire Department	10	City of San Diego
City of Coronado	Coronado Fire Department	2	Heartland Dispatch
City of Del Mar	Del Mar Fire Department	1	North County JPA
City of El Cajon	El Cajon Fire Department	4	Heartland Dispatch
City of Encinitas	Encinitas Fire Department	6	North County JPA
City of Escondido	Escondido Fire Department	7	City of Escondido
City of Imperial Beach	Imperial Beach Fire Department	1	Heartland Dispatch
City of La Mesa	La Mesa Fire Department	3	Heartland Dispatch
City of Lemon Grove	Lemon Grove Fire Department	1	Heartland Dispatch
City of National City	National City Fire Department	3	Heartland Dispatch
City of Oceanside	Oceanside Fire Department	8	North County JPA
City of Poway	Poway Fire Department	3	City of San Diego
City of San Diego	San Diego Fire-Rescue Department	48	City of San Diego
City of San Marcos	San Marcos Fire Department	4	North County JPA
City of Santee	Santee Fire Department	2	Heartland Dispatch
City of Solana Beach	Solana Beach Fire Department	1	North County JPA
City of Vista	Vista Fire Department	6	North County JPA

Sources: City of Carlsbad 2021, City of Chula Vista 2021, City of Coronado 2020, City of Del Mar 2021, Heartland Fire and Rescue 2021, City of Encinitas 2021, City of Escondido 2021, City of Imperial Beach 2021, City of National City 2021, City of Oceanside 2021, City of Poway 2021, City of San Diego 2021.

Table 4.15-2
Fire Service Providers in Unincorporated and Federal Lands in the San Diego Region

Agency	Governance	Fire Service Provider	Number of Stations	Dispatch
Alpine Fire Protection District	Independent	District	1	Heartland JPA
Bonita-Sunnyside Fire Protection District	Independent	District	1	Heartland JPA
Borrego Springs Fire Protection District	Independent	District	1	CAL FIRE

Agency	Governance	Fire Service Provider	Number of Stations	Dispatch
Campo Reservation Fire Protection District	Independent	District	1	Heartland JPA
Deer Springs Fire Protection District	Independent	District/CAL FIRE	3	CAL FIRE
Julian-Cuyamaca Fire Protection District	Independent	District	2	CAL FIRE
Lakeside Fire Protection District	Independent	District	4	Heartland JPA
Lower Sweetwater Fire Protection District	Independent	National City	2	Heartland JPA
North County Fire Protection District	Independent	District	5	North County JPA
Pine Valley Fire Protection District	Independent	District/CAL FIRE	1	CAL FIRE
Rancho Santa Fe Fire Protection District	Independent	District	6	North County JPA
San Marcos Fire Protection District	Dependent	City of San Marcos	3	North County JPA
San Miguel Consolidated Fire Protection District	Independent	District	8	Heartland JPA
Valley Center Fire Protection District	Independent	District/CAL FIRE	2	CAL FIRE
Vista Fire Protection District	Independent	City of Vista	n/a	North County JPA
Mootami MWD	Independent	CAL FIRE	n/a	CAL FIRE
Pauma MWD	Independent	CAL FIRE	n/a	CAL FIRE
Ramona MWD	Independent	CAL FIRE	n/a	CAL FIRE
Rincon del Diablo MWD	Independent	City of Escondido	n/a	City of Escondido
Yuima MWD	Independent	CAL FIRE	n/a	CAL FIRE
Boulevard	Volunteer	SDCFA	1	CAL FIRE
Sunshine Summit	Volunteer	SDCFA	1	CAL FIRE
Ranchita	Volunteer	SDCFA	1	CAL FIRE
Ocotillo Wells	Volunteer	SDCFA	1	CAL FIRE
Intermountain	Volunteer	SDCFA	1	CAL FIRE
De Luz	Volunteer	SDCFA	1	CAL FIRE
Shelter Valley	Volunteer	SDCFA	1	CAL FIRE
Others				
CAL FIRE	State	CAL FIRE	18	CAL FIRE
USFS	Federal	USFS	12	USFS

Sources: San Diego Local Agency Formation Commission (LAFCO) 2005a, 2005b, 2007; County of San Diego 2011; San Miguel Fire District 2021.
SDCFA = San Diego County Fire Authority

Performance of fire protection and emergency services is generally measured with travel or response time standards and service ratios. Travel or response time standards measure the estimated time it will take for responding agency personnel to reach a certain point in their service area from the time of initial call or the

time an emergency vehicle begins moving to the emergency location. These standards differ among agencies. Service ratios are also used to measure the adequacy of service. Service ratio standards typically ensure there are a minimum number of personnel and pieces of equipment to serve a certain population. Water supply and pressure must also be considered when evaluating fire protection services.

Police Protection

The San Diego County Sheriff's Department (SDCSD) is the primary law enforcement body in the San Diego region. SDCSD provides police protection services for the unincorporated areas of the County and the following nine cities: Vista, San Marcos, Santee, Lemon Grove, Imperial Beach, Poway, Encinitas, Del Mar, and Solana Beach. These cities generally provide their own traffic enforcement, while the unincorporated County relies on the California Highway Patrol and SDCSD.

Traffic enforcement, police patrol, and investigative services are provided in the cities of Carlsbad, Chula Vista, Coronado, El Cajon, Escondido, La Mesa, National City, Oceanside, and San Diego by their own city police departments. SDCSD operates several other law enforcement support facilities, including seven detention facilities. These detention facilities provide the services necessary to support a daily average population of more than 5,000 inmates (SDCSD 2018). SDCSD also provides specialized services, such as aerial support, a bomb and arson unit, and a special enforcement detail responsible for highly specialized tactical operations. Forensic services are provided to law enforcement and criminal justice agencies through SDCSD's crime laboratory for all the cities within San Diego County, except for the City of San Diego. Table 4.15-3 shows sworn police protection personnel by jurisdiction in the San Diego region.

Table 4.15-3
Sworn Police Protection Personnel by Jurisdiction in the San Diego Region

Police Protection Providers by Jurisdiction	Number of Sworn Personnel
City of Carlsbad	129
City of Chula Vista	261
City of Coronado	46
City of El Cajon	126
City of Escondido	159
City of La Mesa	69
City of National City	90
City of Oceanside	218
City of San Diego	2,043
San Diego County Sheriff's Department (total)	1,029
City of Del Mar	10
City of Encinitas	61
City of Imperial Beach	28
City of Lemon Grove	24
City of Poway	49
City of San Marcos	81
City of Santee	60
City of Solana Beach	17

Police Protection Providers by Jurisdiction	Number of Sworn Personnel
City of Vista	94
Harbor Police	140

Source: SANDAG 2021.

Local police department staffing goals are set based on different metrics depending on the jurisdiction. For example, some, similar to fire-protection services, evaluate police services based on response times (City of San Diego 2008). Others follow established staffing guidelines set by organizations like the International Association of Chiefs of Police (City of Poway 1991), or base staffing on a ratio of police officers to citizens. Response times can vary among service providers and between urban and rural areas. Urbanized areas generally see a much faster response time than rural areas. Response times are also measured against the type of emergency. Calls are generally ranked into different priority levels, where the higher priority call receives a faster response time goal. The lowest priority calls are generally for issues such as animal noise disturbance, while the highest priority calls include officer assistance and generally involve more serious crimes. Unlike fire protection emergency responses that are dispatched from a central location, police units respond while on patrol.

Schools

The public school system in the San Diego region has approximately 506,260students enrolled in kindergarten through 12th (K-12) grade. There are roughly 44 public school districts with about 742 schools throughout the region, staffed with over 25,783 teachers. In addition to public primary and secondary schools, there is an ever-growing number of charter schools at all grade levels in the San Diego region. Higher education is represented by eight community colleges, three public higher education institutions, and several private education schools throughout the region (California Department of Education 2019a, 2019b). Table 4.14-4 identifies K-12 public school districts that provide education at the elementary, middle/intermediate, and high school levels, and their enrollment statistics.

Table 4.15-4
2018-2019 Student Enrollment and Staffing by District in the San Diego Region

District	District Type	Elementary School Students	Elementary Schools	Middle/ Intermediate School Students	Middle/ Intermediate Schools	High School Students	High Schools	Other School Types	Total Students	Number of Teachers*	Number of Students per Teacher
Alpine Union Elementary	Elementary	1,113	4	347	1	N/A	N/A	1	1,764	69	24.3
Bonsall Union Elementary	Elementary	1,826	3	459	1	371	1	N/A	2,656	119	21.2
Borrego Springs Unified	Unified	221	1	69	1	4,000	2	N/A	4,290	131	21.8
Cajon Valley Union	Elementary	14,542	20	4,177	7	N/A	N/A	2	18,720	873	20.9
Cardiff Elementary	Elementary	722	2	N/A	N/A	N/A	N/A	N/A	722	46	16.7
Carlsbad Unified	Elementary	5,956	9	1,879	3	3,891	2	2	11,726	521	23.2
Chula Vista Elementary	Elementary	31,989	46	N/A	N/A	N/A	N/A	3	31,989	1,561	19.2
Coronado Unified	Unified	1,520	2	510	1	1,203	1	N/A	3,233	157	20.7
Dehesa Elementary	Elementary	8543-1420	2	1,420		2,545		8	11,088	876	24.2
Del Mar Union Elementary	Elementary	4,456	8	N/A	N/A	N/A	N/A	N/A	4,456	246	18.9
Encinitas Union Elementary	Elementary	5,443	9	N/A	N/A	N/A	N/A	N/A	5,443	256	21.2
Escondido Union	Elementary	7,123	21	4,436	5	N/A	N/A	N/A	19,322	1,059	18.0
Escondido Union High	High School	N/A	N/A	N/A	N/A	9,947	7	1	9,977	472	20.8
Fallbrook Union Elementary	Elementary	4,449	6	1,058	1	N/A	N/A	3	5.507	249	20.8
Fallbrook Union High	High School	N/A	N/A	N/A	N/A	2,298	1	2	2,299	102	21.2

District	District Type	Elementary School Students	Elementary Schools	Middle/ Intermediate School Students	Middle/ Intermediate Schools	High School Students	High Schools	Other School Types	Total Students	Number of Teachers*	Number of Students per Teacher
Grossmont Union High	High School	N/A	N/A	N/A	N/A	22,205	11	7	22,215	1,040	21.4
Jamul-Dulzura Union Elementary	Elementary	592	1	204	1	50	N/A	1	846	35	22.1
Julian Union High	High School	N/A	N/A	N/A	N/A	111	1	N/A	111	10	11.5
La Mesa-Spring Valley	Elementary	10,415	22	2,964	1	N/A	N/A	1	13,379	501	25.5
Lakeside Union Elementary	Unified	4,545	8	1,252	2	280	1	1	6,077	263	21.6
Lemon Grove	Elementary	3,015	6	860	N/A	N/A	N/A	N/A	3,875	174	20.9
Mountain Empire Union	Unified	2,716	4	830	2	2,040	1	9	5,586	249	13.7
National Elementary	Elementary	5941	11	N/A	N/A	N/A	N/A	N/A	5,941	288	19.6
Oceanside Unified	Unified	11,489	16	3,225	4	6,517	2	3	21,231	934	21.8
Poway Unified	Unified	19,676	26	5,909	6	11,705	5	1	37,290	1,570	24.4
Romana City Unified	Unified	2961	5	937	1	1,849	1	4	5,747	243	23.3
Rancho Santa Fe Elementary	Elementary	462	1	147	1	N/A	N/A	N/A	609	66	10.0
San Diego County Office of Education	County Office of Education (COE)	3,694	4	1,174	N/A	3,050	1	10	7,918	439	14.1
San Diego Unified	Unified	72,535	138	19,797	32	39,372	29	23	131,706	6,435	20.0
San Diego Union High	High School	N/A	N/A	4,301	5	9,114	4	1	13,415	563	25.1
San Marcos Unified	Unified	11,620	12	3,530	3	6,690	2	3	21,840	46	487.8
San Pasqual Union Elementary	Elementary	603	1	N/A	N/A	N/A	N/A	N/A	603	34	18.2

District	District Type	Elementary School Students	Elementary Schools	Middle/ Intermediate School Students	Middle/ Intermediate Schools	High School Students	High Schools	Other School Types	Total Students	Number of Teachers*	Number of Students per Teacher
Santee Elementary	Elementary	4,732	9	N/A	N/A	N/A	N/A	2	7,227	311	22.2
SBC – High Tech High	Statewide Benefit Charter	1,033	2	443	2	1,088	3	N/A	2,564	133	19.0
Solana Beach Elementary	Elementary	3,111	7	N/A	N/A	N/A	N/A	N/A	3,111	185	16.4
South Bay Union Elementary	Elementary	7,715	11	N/A	N/A	N/A	N/A	N/A	7,715	334	21.9
Spencer Valley Elementary	Elementary	1,243	1	N/A	N/A	N/A	N/A	2	3,307	275	28.4
Sweetwater Union High	High School	N/A	N/A	11,915	11	29,836	13	6	42,730	1,893	22.0
Vallecitos Elementary	Elementary	224	1	N/A	N/A	N/A	N/A	N/A	224	12	17.0
Valley Center-Pauma Unified	Unified	2,173	4	713	1	1,314	1	2	4,200	185	22.8
Vista Unified	Unified	12,941	16	3,543	5	10,250	4	8	26,734	1,191	20.7
Warner Unified	Unified	1,234	2	N/A	N/A	513	1	2	1,747	108	14.4

Source: CDE 2019a

Facility planning for public schools is generally based on student generation rates, which vary by jurisdiction and development type. The generation rates are compared against the current capacity of individual school facilities that would be affected by the growth. Historical data and future plans for an area are used to project the number of students that will eventually be a part of the community.

Libraries

The San Diego County Library operates branches in the cities of Del Mar, El Cajon, Encinitas, Imperial Beach, La Mesa, Lemon Grove, Poway, San Marcos, Santee, Solana Beach, and Vista, as well as in the unincorporated areas of the County and two bookmobiles. The cities of Carlsbad, Chula Vista, Coronado, Escondido, National City, Oceanside, and San Diego maintain and operate their own library systems. Table 4.15-5 shows the city and county public library systems in the San Diego region. The libraries of California State University, San Marcos; San Diego State University; and the University of California, San Diego are also open to the public, but community members must pay an annual fee in order to check out library resources. The San Diego County Public Law Library (Law Library) is open to the general public, as well as California legal professionals, and provides them with legal materials and information. The Law Library is funded through the County of San Diego general fund, in addition to a portion of collected court fees. Some libraries have adopted master plans for their system facilities to assess their needs, while others developed service standards, such as square footage of the facility per resident in a defined service area.

Table 4.15-5
Municipal and County Public Library Systems in the San Diego Region

Library	Total Outlets	Total Visits	Total Circulation	Total Collection Use	Total Programs
Carlsbad City Library	3	126,000	936,797	1,030,255	1,719
Chula Vista Public Library	3	961,848	500,195	509,994	1,506
Coronado Public Library	1	244,436	251,978	414,688	575
Escondido Public Library	3	234,750	371,765	390,468	493
National City Public Library	1	107,228	73,853	86,702	1,280
Oceanside Public Library	5	321,109	284,041	289,328	1,253
San Diego County Library	35	3,294,000	8,631,175	8,921,429	17,916
San Diego Public Library	36	5,377,801	6,196,778	26,186,544	13,615

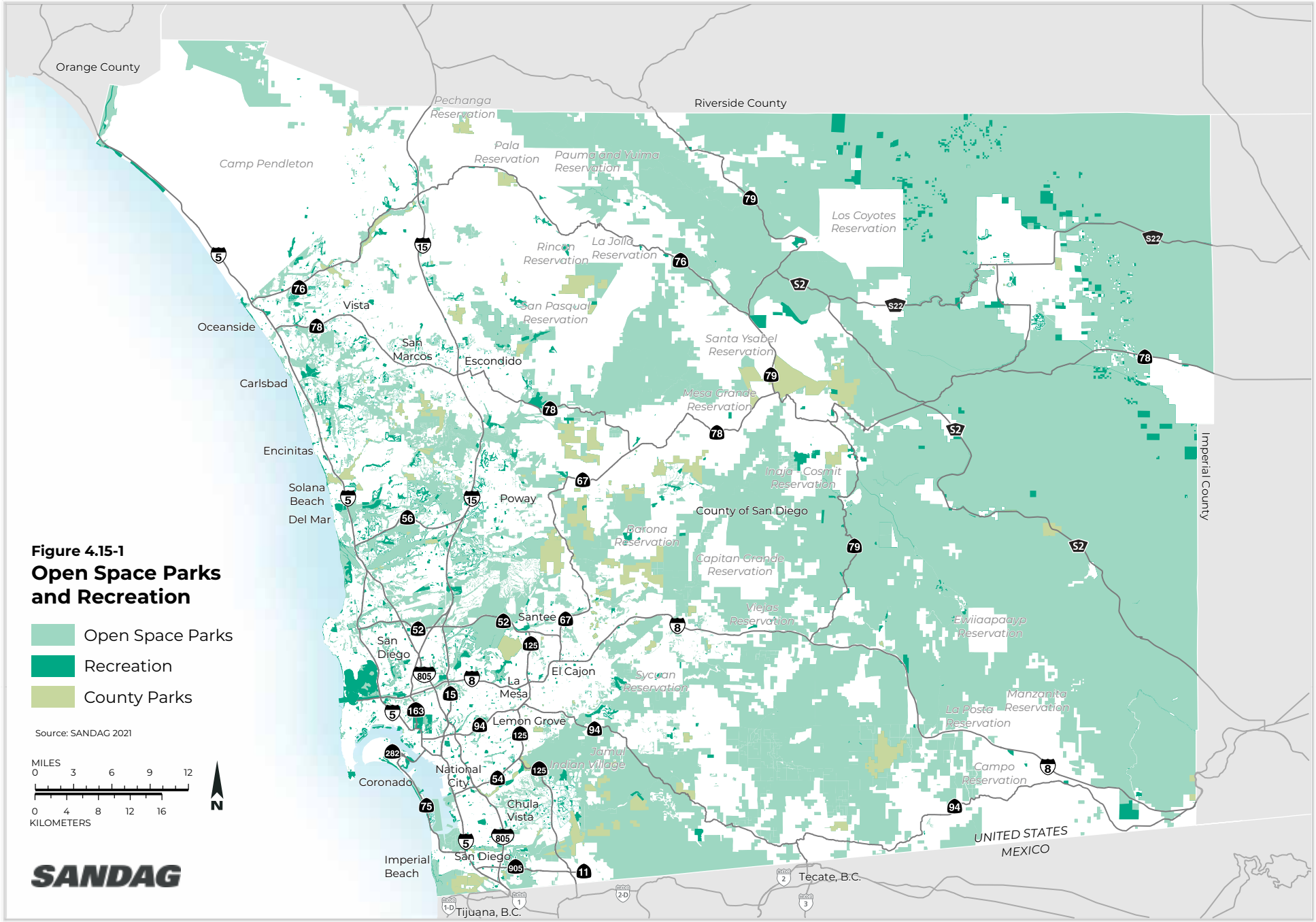
Source: California State Library 2021

Recreational Facilities

San Diego County has hundreds of designated parks, with uses including camping parks, preserves, sports parks, beaches, community and teen centers, golf courses/clubhouses, convention centers, marinas, casinos, botanical gardens, landscaped open space, undeveloped natural areas, historic sites, day use parks, racetracks, tourist attractions, and other recreational uses (Figure 4.15-1). As of 2016, these parks and open spaces span over 1,300,000 acres throughout the San Diego region. Trails and pathways allow for walking, hiking, biking, and horseback riding throughout the region and connect scenic and recreational areas. Trails include the California Coast Trail, which, once completed, will be a 1,200-mile contiguous public right-of-way from the northern to southern border of California to allow for coastal access (California Coastal Conservancy 2019).

Parkland and open space in the San Diego region are owned by federal, State, and local government agencies, as well as tribes, public utilities, private owners, and joint use agreements. Funding for parks comes from existing sources from their respective owners, as well as tax increment financing, bonds, donations, JPAs, and others. It is also a common practice to charge development fees for new development projects to be used to develop parks within that community.

Public park and recreational facilities can be provided by school districts, community service districts, park and recreation districts, and nonprofit agencies. These facilities include community, senior, and youth centers, sports fields, stadiums, public and private golf courses, visitors centers, amusement parks, fairgrounds, equestrian centers, facilities used for water-oriented recreational purposes, ranches, and private/commercial recreation facilities. Funding for these sites is generally provided by the local jurisdiction.


Orange County
Riverside County
Imperial County
County of San Diego
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Santee
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
San Diego
Imperial Beach
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.15-1
Open Space Parks and Recreation
Open Space Parks
Recreation
County Parks
Source: SANDAG 2021
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

UTILITIES

Wastewater Collection and Treatment Facilities

The San Diego region is served by over 7,903 miles of pressure and gravity sewer lines, as well as pipes, sewer laterals, and pump stations to move wastewater from its source to a wastewater treatment plant. The wastewater is generated by a variety of residential, commercial, and industrial actions throughout the region. Table 4.15-6 identifies existing wastewater collection systems in the San Diego region.

Wastewater treatment facilities remove solids and contaminants by a variety of methods. The treated wastewater is then released through ocean outfalls, percolation beds, or groundwater recharge. Water reclamation facilities are also used throughout the region and can further treat the water so that it may be used again for agriculture, construction, or other commercial and industrial processes (see Section 4.18). Depending on the process used to treat the biosolids produced during water treatment, the products can be disposed of in designated landfills or municipal solid waste landfills, or used to fertilize crops. Table 4.15-7 identifies the capacity of permitted wastewater treatment facilities in the San Diego region.

Most rural areas in San Diego County do not have a sanitary sewer system and must use onsite wastewater treatment systems, such as septic tanks. Most commonly, these systems consist of a septic tank connected to a leach line. Septic tanks are discussed further in Section 4.9, *Hazards and Hazardous Materials*.

Table 4.15-6
Wastewater Collection Systems in the San Diego Region by Responsible Agency

Responsible Agency	Collection System (CS)	Pressure Sewer (miles)	Gravity Sewer (miles)	Lateral Sewer (miles)
22nd District Agricultural Association	22nd District Agricultural Association CS	0.7	1.6	1.5
Borrego Water District	Borrego Wd-Rams Hill CS	2.8	12.5	1.6
Buena Sanitation District	Buena CS	3	93.3	0
CSU San Diego	San Diego State University CS	0	6	4
Ca Dept of Parks & Rec Winterhaven	San Mateo Campground/San Onofre CS	1.2	0.6	0.1
Carlsbad MWD	Carlsbad MWD CS	3.9	282	0
Chula Vista City	City of Chula Vista CS	3.4	511	10
Coronado City	City of Coronado CS	6.6	39.3	0
Del Mar City	City Of Del Mar CS	3.8	29	0
El Cajon City	City of El Cajon CS	0	195	0
Encinitas City	City of Encinitas CS	4.5	124	0
Escondido City	HARRF Discharge To San Elijo OO CS	8.5	345	0
Fallbrook Public Utility District	Fallbrook PUD CS	4.6	78.6	0
Imperial Beach City	City of Imperial Beach CS	6	39.5	0
La Mesa City	City of La Mesa CS	0	155	0
Lemon Grove City	City of Lemon Grove CS	0.1	62.4	0

Responsible Agency	Collection System (CS)	Pressure Sewer (miles)	Gravity Sewer (miles)	Lateral Sewer (miles)
Leucadia Wastewater District	Leucadia Wastewater District CS	16.67	205	0
National City	City of National City CS	1	105	0
Oceanside City	City of Oceanside Collection System, La Salina WWTP	37.7	445.6	0
Olivenhain Municipal Water District	4-S Ranch CS	20	65	0
Otay MWD	Otay Water District CS	2.2	82	0
Padre Dam Municipal Water District	Padre Dam CS	4.6	164.5	0
Poway City	City of Poway CS	3.5	185	75
Rainbow Municipal Water District	Rainbow Municipal Water Dist CS	3	87	0
Ramona MWD	San Vicente Treatment Plant CS	1	40	28
Ramona MWD	Santa Maria CS	4	45	31
Rancho Santa Fe Community Services District	Rancho Santa Fe San Dist Plant CS	6	65	0
Rancho Santa Fe Community Services District	Santa Fe Valley CS	2	19.7	0
San Diego City (City Attorney's Office at Civic Center Plaza)	San Diego City CS (Wastewater Collection System)	112.51	2,931.40	0
San Diego County Dept of Public Works	County of San Diego CS	5.3	422	0
San Diego County Dept of Public Works	Julian Water Pollution Facil. CS	0.6	3	0
Solana Beach City	City Of Solana Beach CS	2	49	0
UC San Diego	University Of California, San Diego CS	0.5	26.5	3
US Marine Corps Base Camp Pendleton	USMC Base, Camp Pendleton CS	39.2	125	79.5
US Marine Corps Recruit Depot	MCRD CS	0	4	2.5
Vallecitos Water District	Meadowlark CS	7.63	259.27	0
Valley Center MWD	Lower Moosa Canyon Recl Facil CS	5	50	0
Valley Center MWD	Woods Valley CS	5	6	0
Vista City	City of Vista CS	0.3	214.5	0

Source: SWRCB 2021.

Table 4.15-7
Wastewater Treatment and Water Recycling Facilities in the San Diego Region

Responsible Agency	Facility Name	Planned Capacity (2020) million gallons per day			Planned Capacity (2045) million gallons per day			Effluent Quality for TDS (mg/L)	Disposal Method
		P	S	T	P	S	T		
Carlsbad MWD	Carlsbad WRF	-	-	7.4	-	-	12.0	1,000	Irrigation
Encina Wastewater Authority	Encina WPCF	43.3	43.3	-	43.3	43.3		1,031	Outfall-Reuse
Escondido, City of	Hale Avenue RRF/WRF	18.0	18.0	9.0	27.0	27.0	20.0	1,000	Reuse-Outfall-Stream
Fairbanks Ranch CSD	Fairbanks Ranch WPCF	0.3	0.3	-	0.3	0.3	0.3	1,100	Percolation
Fallbrook PUD	Fallbrook Plant #1 WRF	2.7	2.7	2.7	2.7	2.7	2.7	850	Reuse-Outfall
Leucadia Wastewater District	Forest R. Gafner WRP	1.0	1.0	1.0	1.0	1.0	1.0	1,000	Reuse-Outfall
Oceanside, City of	La Salina WWTP	5.5	5.5	-	-	-	-	897	Outfall
Oceanside, City of	San Luis Rey WRF	13.5	13.5	1.5	17.4	17.4	7.5	874	Reuse-Outfall
Olivenhain MWD	4S Ranch WWTP	2.0	2.0	2.0	2.0	2.0	2.0	1,000	Reuse
Otay WD	Ralph W. Chapman WRF	1.3	1.3	1.3	1.3	1.3	1.3	850	Reuse-Outfall
Padre Dam MWD	Padre Dam WRF	6.0	6.0	5.7	6.0	6.0	5.7	800	Reuse-Outfall
Ramona WMD	Santa Maria WRP	-	1.0	0.4	-	1.0	0.4	850	Reuse-Stream
Ramona MWD	San Vicente WRP	-	-	0.5	-	-	0.6	550	Reuse-Stream
Rancho Santa Fe CSD	Santa Fe Valley WRF	-	-	0.5	-	-	0.5	1,000	Irrigation
Rancho Santa Fe CSD	Rancho Santa Fe WRF	0.5	0.5	-	0.6	0.6	0.6	1,100	Percolation

Responsible Agency	Facility Name	Planned Capacity (2020) million gallons per day			Planned Capacity (2045) million gallons per day			Effluent Quality for TDS (mg/L)	Disposal Method
		P	S	T	P	S	T		
San Diego, City of (MWWD)	North City WRP	30.0	30.0	24.0	52.0	52.0	52.0	1,000	Reuse-Outfall
San Diego, City of (MWWD)	Point Loma WWTP	240.0	-	-	240.0	-	-	1,700-3,000	Outfall
San Diego, City of (MWWD)	South Bay WRP	15.0	15.0	15.0	36.0	36.0	36.0	1,000	Reuse-Outfall
San Elijo JPA	San Elijo WRF	5.3	5.3	3.0	5.3	5.3	5.3	950	Reuse-Outfall
Camp Pendleton Marine Corps Base	Southern Region TTP	-	-	7.5	-	-	7.5	750	Irrigation/Outfall
Camp Pendleton Marine Corps Base	Northern Region TTP	-	-	4.0	-	-	4.0	750	Irrigation/Percolation
Vallecitos WD	Meadowlark WRF	5.0	5.0	5.0	5.0	5.0	5.0	1,000	Reuse
Valley Center MWD	Lower Moosa Canyon WRF	0.4	0.4	0.4	0.875	0.875	0.875	1,000	Irrigation
Valley Center MWD	North Village WRF	-	-	-	0.125	0.125	0.125	1,000	Irrigation
Valley Center MWD	Welk WRF	-	-	-	0.125	0.125	0.125	1,000	Irrigation (Golf Course)
Valley Center MWD	Lilac Ranch WRF	-	-	-	0.125	0.125	0.125	1,000	Irrigation
Valley Center MWD	Woods Valley Ranch WRF	0.275	0.275	0.275	0.475	0.475	0.475	1,000	Irrigation (Golf Course)
Valley Center MWD	Meadowood WRF	0.170	0.170	0.170	0.170	0.170	0.170	1,000	Irrigation
Whispering Palms CSD	Whispering Palms WPCF	0.5	0.5	-	0.5	0.5	0.5	963	Pasture-Percolation
Total Capacity		105.73	106.73	67.66	266.50	267.50	230.78		

Source: SDCWA 2015.
P: Primary Treatment; S: Secondary Treatment; T: Tertiary Treatment; CSD: Community Services District; mg/L: milligrams per liter; MWD: Municipal Water District; RRF: Resource Recovery Facility; TDS: Total Dissolved Solids; TTP: Tertiary Treatment Plant; WPCF: Water Pollution Control Facility; WRF: Water Reclamation/ Recycling Facility; WRP: Water Reclamation Plant; WWTP: Wastewater Treatment Plant

City of San Diego Metropolitan Sewerage System

The Metropolitan Sewerage System, which is owned and operated by the City of San Diego Public Utilities Department's Wastewater Branch, provides regional wastewater treatment services for the City of San Diego and 15 other cities and sanitation districts: Chula Vista, Coronado, Del Mar, El Cajon, Imperial Beach, La Mesa, National City, and Poway; the Lemon Grove Sanitation District; the Padre Dam Municipal and Otay water districts; and the County of San Diego (on behalf of the Winter Gardens Sewer Maintenance District, and the Alpine, Lakeside, and Spring Valley sanitation districts).

The Metropolitan Sewerage System comprises the Point Loma Wastewater Treatment Plant and Ocean Outfall, the North City Water Reclamation Plant and South Bay Water Reclamation Plant, the Metro Biosolids Center, the Environmental Monitoring and Technical Services Laboratory, nine major pump stations, and 75 smaller pump stations (City of San Diego 2018). The pump stations move wastewater through sewers to the various treatment plants.

The Point Loma Wastewater Treatment Plant treats roughly 175 million gallons of wastewater per day (although it has a maximum capacity of 240 million gallons per day) and discharges it through the Point Loma Ocean Outfall into the Pacific Ocean (City of San Diego 2018). Any sludge or biosolids accumulated from the processing of the wastewater at this plant is sent to the Metro Biosolids Center for further processing. Up to 30 million gallons of wastewater can be treated per day at the North City Water Reclamation Plant (City of San Diego 2018). Wastewater from northern San Diego is processed and purified, and then redistributed through a reclaimed water pipeline for irrigating, landscaping, and industrial uses. Water processed through the South Bay Water Reclamation Plant can either be discharged into the ocean through the South Bay Ocean Outfall or sent on to Tertiary Treatment to be used for reclaimed water purposes. The South Bay Water Reclamation Plant has the capacity to process 15 million gallons per day (City of San Diego 2018).

South Bay International Wastewater Treatment Plant

The International Boundary and Water Commission (IBWC) Minute No. 283 of July 8, 1990, was approved by both the United States and Mexico, which allowed for the establishment of the "Clean Water Partnership" binational interagency and authorized the construction of the South Bay International Wastewater Treatment Plant (SBIWTP). The SBIWTP was constructed as a response to untreated wastewater flowing north from Tijuana and polluting the Tijuana River in the United States. The plant provides secondary treatment for 25 million gallons of sewage per day that is then discharged into the Pacific Ocean (IBWC 2018). The treatment plant is located in San Ysidro, about 2 miles west of the point of entry and directly north of Tijuana's main wastewater pumping station.

Stormwater Drainage Facilities

Stormwater runoff occurs when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not infiltrate into the ground. This effect is increased by the amount of impervious surfaces (paved streets, parking lots, and building rooftops). In more rural, less developed areas, such as in the unincorporated County, stormwater is able to flow into natural drainage sites, such as creeks, streams, or rivers. In urban areas, stormwater runoff is collected in a Municipal Separate Storm Sewer System (MS4), through a system of conveyances consisting of roads with drainage systems, streets, catch basins, curbs, gutters, ditches, artificial channels, or storm drains. Stormwater systems such as these are designed to prevent flooding in urban areas, control erosion, and protect water quality. Section 4.10*, Hydrology and Water Quality,*

provides a discussion and analysis of the hydrology and water quality impacts of stormwater associated with the implementation of the proposed Plan.

Each MS4 operator, identified in Table 4.15-8, is responsible for operation, maintenance, and management of its own system. MS4s are interconnected, and their operators often share facilities, cooperatively manage systems, and coordinate pollution control efforts.

Table 4.15-8
Operators of Municipal Separate Storm Sewer Systems in the San Diego Region

Facility Name	Agency/Discharger	City
Carlsbad MS4	Carlsbad City	Carlsbad
Chula Vista MS4	Chula Vista City	Chula Vista
Coronado MS4	Coronado City	Coronado
Del Mar MS4	Del Mar City	Del Mar
El Cajon MS4	El Cajon City	El Cajon
Encinitas MS4	Encinitas City	Encinitas
Escondido MS4	Escondido City	Escondido
Imperial Beach MS4	Imperial Beach City	Imperial Beach
La Mesa MS4	La Mesa City	La Mesa
Lemon Grove MS4	Lemon Grove City	Lemon Grove
National City MS4	National City	National City
Oceanside MS4	Oceanside City	Oceanside
Poway MS4	Poway City	Poway
San Diego City, MS4	San Diego City Storm Water	San Diego
San Diego County, MS4	San Diego County Department of Environmental Health	San Diego
San Diego International Airport MS4	San Diego County Regional Airport Authority	San Diego
San Diego Port District MS4	San Diego Unified Port District	San Diego
San Marcos MS4	San Marcos City	San Marcos
Santee MS4	Santee City	Santee
Solana Beach MS4	Solana Beach City	Solana Beach
Vista MS4	Vista City	Vista
Caltrans MS4	Caltrans	Statewide
Phase II Small MS4	Del Mar Fairgrounds	Del Mar
Phase II Small MS4	UCSD	San Diego

Source: SWRCB 2015.

Each jurisdiction within the Plan Area requires the implementation of stormwater pollution prevention techniques, so that conveyance systems are designed to protect surface and ground water quality, as mandated by State and federal regulations. These regulations require a multifaceted approach that involves infrastructure improvements and maintenance; water quality monitoring; source identification of pollutants; land use planning policies and regulations; and pollution prevention activities such as education, code enforcement, outreach, public advocacy, and training, and are explained in more detail in Section 4.15.2, *Regulatory Setting*.

Electricity and Natural Gas Services

San Diego County is served by San Diego Gas and Electric (SDG&E), which provides electricity and natural gas to over 3.6 million customers (i.e., 1.4 million accounts) in the county and portions of southern Orange County. The utility has a diverse power production portfolio, composed of a variety of renewable and non-renewable sources. Energy production typically varies by season and by year. Regional electricity loads also tend to be higher in the summer because the higher summer temperatures drive increased demand for air-conditioning. In contrast, natural gas loads are higher in the winter because the colder temperatures drive increased demand for natural gas heating. See Table 4.15-9 for a summary of electricity and natural gas use within SDG&E service area.

Table 4.15-9
Electricity and Natural Gas Consumption in the SDG&E Service Area in 2019

Sector	Electricity (GWh)	Natural Gas (million therms)
Agriculture and Water Pump	355	5
Commercial	10,865	200
Industry	1,342	21
Mining and Construction	395	4
Residential	7,435	304
Streetlight	90	--
Total	20,481	534

Source: CEC 2019b.

Telecommunications Services

Telecommunications services, including telephone and cellular phone services, cable television, and internet and broadband services in the San Diego region, are provided by a number of privately owned companies.

Telephone and Cellular Phone

Local phone service in the San Diego region is provided primarily by AT&T, which offers traditional landline (copper wire) service as well as digital telephone service. Digital telephone service is offered by a number of other providers including Cox, Time Warner, Vonage, and a variety of smaller companies.

AT&T, Sprint Nextel Corporation, T-Mobile, Verizon Wireless, and Spectrum are some of the cellular telephone providers offering service in the San Diego region. Providers use a combination of underground lines and above ground cellular towers to provide telephone service to the Plan Area. Cellular towers are distributed throughout the San Diego region to provide coverage.

Cable Television and Internet

Cable television and internet services are offered by many of the same companies that provide cellular phone service in the area and can be delivered via a number of different technologies, including mobile (cellular), wireless, wireless local area network, and broadband. Fiber optic cables and copper wires are generally co-located with other utility infrastructure, which is usually installed underground within new development in order to reduce visual and safety hazards. With the recent advent of streaming services, only broadband internet infrastructure is needed to access television service.

Broadband refers to a high-speed internet connection that can transport multiple signals and traffic types. According to the Federal Communications Commission (FCC) (2017), 100 percent of residents in the San Diego region currently have access to broadband via at least one provider.

Table 4.15-10
Fixed Broadband Providers in the San Diego Region

Provider	Technology
A+ Wireless	Cable
Accel Wireless	Terrestrial Fixed Wireless
Allstream	Optical Carrier/Fiber, Other Copper Wireline
AT&T	DSL, Optical Carrier/Fiber, Fixed Wireless
Birch Communications	DSL, Other Copper Wireline
Block Line Systems	Optical Carrier/Fiber
California Internet	Terrestrial Fixed Wireless
Call One	Optical Carrier/Fiber, Other Copper Wireline
CBTS Technology Solutions	Other Copper Wireline
Cellco	Terrestrial Fixed Wireless
Charter Communications, Inc.	Cable, Optical Carrier/Fiber
Cogent Communications	Optical Carrier/Fiber, Other Copper Wireline
Comcast	Cable
Compudyne	Optical Carrier/Fiber, Terrestrial Fixed Wireless
Consolidated Communications	Optical Carrier/Fiber
Consolidated Smart Systems	Cable
Cox Communications, Inc.	Cable, Optical Carrier/Fiber
Earthlink	DSL, Optical Carrier/Fiber, Other Copper Wireline
Frontier Communications	DSL
GCI Communication	Satellite
Google Fiber	Optical Carrier/Fiber
HUGHES	Satellite
Level 3 Communications	Optical Carrier/Fiber, Other Copper Wireline
Logix Communications	Optical Carrier/Fiber
MCI Communications	Optical Carrier/Fiber, Other Copper Wireline
Mediacom	Cable
Netfortris	Optical Carrier/Fiber, Other Copper Wireline
Network Billing Systems	Optical Carrier/Fiber, Other Copper Wireline
One Ring Networks	Other Copper Wireline, Terrestrial Fixed Wireless
PAETEC Communications	DSL, Optical Carrier/Fiber
Sail Internet	Terrestrial Fixed Wireless
San Diego Broadband	Terrestrial Fixed Wireless
SDWISP	Terrestrial Fixed Wireless
Sky Valley Network	Terrestrial Fixed Wireless
Southern California Telephone Company	Terrestrial Fixed Wireless

Provider	Technology
Tailwind Voice & Data	DSL, Cable Modem, Optical Carrier/Fiber, Other Copper wireline
Tierzero	Optical Carrier/Fiber, Other Copper Wireline, Terrestrial Fixed Wireless
U.S. Telepacific	Optical Carrier/Fiber, Other Copper Wireline, Terrestrial Fixed Wireless, DSL
Utility Telecom	Optical Carrier/Fiber, Other Copper Wireline
ViaSat	Satellite
VSAT Systems	Satellite
Wave Broadband	Cable, Optical Carrier/Fiber
Webpass	Optical Carrier/Fiber, Terrestrial Fixed Wireless
XO Communication Services	Optical Carrier/Fiber, Other Copper Wireline
Zayo	Optical Carrier/Fiber
Zito Media	Cable

Source: FCC 2020.

Solid Waste Disposal and Recycling Facilities

The County of San Diego is the designated local enforcement agency (LEA) for all solid waste facilities in the region except for facilities within the City of San Diego, which is its own LEA. The LEAs are certified by the California Department of Resources Recycling and Recovery (CalRecycle) and have the responsibility of ensuring that solid waste facilities are operated and closed correctly and that solid waste is stored and transported properly. LEAs can issue operating permits to facilities, including landfills, transfer stations, material recovery, and composting facilities.

Solid Waste Generation

Solid waste refers to garbage, refuse, and other discarded solid materials that are generated by residential, commercial, and industrial activities. Solid waste is measured in volume and weight, and is classified into one of eight categories: paper, plastics, glass, metals, yard waste, other organics, other wastes, and special wastes. CalRecycle provides specific definitions of these classifications on their website (CalRecycle 2018a).

Solid waste generation is measured by disposal and diversion. Disposal is defined in PRC Section 40192 as "the final deposition of solid wastes onto land, into the atmosphere, or into the waters of the state." Diversion includes programs and practices such as waste prevention and source reduction, recycling, reuse, and composting that reduce the total amount of waste that requires disposal. Table 4.15-11 shows the 2016 waste generation and disposal rates by jurisdiction.

Table 4.15-11
Total Waste Generation Rates and Annual Disposal Rates by Jurisdiction in the San Diego Region

City	2016 Total Waste Generation (tons)	2016 Annual Disposal Rate (PPD)
City of Carlsbad	158,252	7.3
City of Chula Vista	182,251	3.7
City of Coronado	41,826	11.5

City	2016 Total Waste Generation (tons)	2016 Annual Disposal Rate (PPD)
City of Del Mar	12,911	14.5
City of El Cajon	99,769	4.9
City of Encinitas	66,579	5.8
City of Escondido	162,547	5.6
City of Imperial Beach	16,724	3.4
City of La Mesa	51,551	4.7
City of Lemon Grove	21,187	4.0
City of National City	60,198	4.9
City of Oceanside	133,395	4.1
City of Poway	50,895	5.5
City of San Diego	1,521,363	6.3
City of San Marcos	86,589	4.9
City of Santee	49,708	4.6
City of Solana Beach	14,311	5.9
City of Vista	97,376	5.3
Unincorporated San Diego	492,691	5.2
Total	3,320,123	108.8

Source: CalRecycle 2021d.
PPD = pounds per day.

Landfills

There are four landfills in the San Diego region, three of which are privately operated and one of which is operated by the City of San Diego. The landfills receive a total daily throughput of approximately 19,750 tons per day. Together, they have a total remaining capacity of 146,359,020 cubic yards, which is roughly 48 percent of their total permitted capacity (CalRecycle 2021). Table 4.15-12 shows the remaining capacity of landfills located in the San Diego region and their estimated closure dates. Marine Corps Base Camp Pendleton operates two additional landfills for its exclusive use that are not included in the table.

Table 4.15-12
Landfills Located in the San Diego Region and Estimated Capacity

Facility	Operator	Solid Waste Information System No.	Throughput (tons/day)	Maximum Permitted Capacity (cubic yards)	Remaining Capacity (cubic yards)	Percent Capacity Remaining	Estimated Closure Date
Borrego Landfill	Borrego Landfill, Inc.	37-AA-0006	50	476,098	111,504	23	2046
Otay Landfill	Otay Landfill, Inc.	37-AA-0010	6,700	61,154,000	21,194,008	35	2030

Facility	Operator	Solid Waste Information System No.	Throughput (tons/day)	Maximum Permitted Capacity (cubic yards)	Remaining Capacity (cubic yards)	Percent Capacity Remaining	Estimated Closure Date
Miramar Landfill	City of San Diego	37-AA-0020	8,000	97,354,735	11,080,871	11	2030
Sycamore Landfill	Sycamore Landfill, Inc.	37-AA-0023	5,000	147,908,000	113,972,637	77	2042
Total			**19,750**	**306,892,833**	**146,359,020**	**48**	

Source: CalRecycle 2021a.

Collection, Transfer, and Material Recovery Facilities

Solid waste generated from residences and businesses in the San Diego region is collected by private operators, under contract with each of the cities and the County, and permitted by the State. The City of San Diego is an exception in the region and operates its own solid waste management system, including solid waste collection.

Twenty transfer stations in the region receive solid waste and transfer it into vehicles or containers to be moved to a landfill or transformation facility. There are fourteen additional transfer stations that are combined with material recovery facilities (MRFs) that remove recyclables and other valuable materials from the solid waste as it is being processed. A final transfer station also chips and grinds wood waste. MRFs process unseparated trash or separated trash with commingled recyclables. The total daily throughput capacity for the region of these facilities is 19,750 tons. Table 4.15-13 provides a list of transfer facilities and MRFs for the region and their individual daily throughputs.

Table 4.15-13
Transfer/Processing Facilities in the San Diego Region

Facility	Operator	Solid Waste Information System (SWIS) Number	Maximum Permitted Throughput (Tons/Day)
EDCO Recycling	EDCO Disposal, Inc.	37-AA-0964	516
SANCO Recycling	SANCO Services	37-AA-0956	1,000
Ramona MRF and Transfer Station	JEMCO Equipment Corporation	37-AA-0925	700
Universal Refuse Removal Recycling & TS	Universal Refuse Removal	37-AA-0929	1,000
Palomar Transfer Station, Inc.	Palomar Transfer Station, Inc	37-AH-0001	2,250
EDCO Recovery and Transfer Station	EDCO Disposal Corporation	37-AA-0105	1,500
Escondido Resource Recovery	JEMCO Equipment Corporation	37-AA-0906	3,223
EDCO Station	EDCO Disposal Corporation	37-AA-0922	1,000
Fallbrook Recycling Facility	Fallbrook Refuse Service	37-AA-0923	500

Facility	Operator	Solid Waste Information System (SWIS) Number	Maximum Permitted Throughput (Tons/Day)
Amswede Recycling	Amswede Inc.	37-AA-0952	175
EDCO CDI Recycling	EDCO Waste and Recycling Services	37-AA-0953	175
SANCO Resource Recovery	SANCO Services	37-AA-0956	1,000
EDCO Waste and Recycling – LVT Op.	EDCO Waste and Recycling	37-AA-0969	15
Coast Waste Management, Inc. LVTS	Coast Waste Management, Inc.	37-AA-0966	15
Waste Management of San Diego – LVTO	Universal Refuse Removal Recycling & TS	37-AA-0967	15
Escondido Disposal, Inc.	Escondido Disposal, Inc.	37-AA-0970	15
EDCO Bin Yard	EDCO Bin Yard	37-AA-0972	15
Otay CDI MVPF	Otay Landfill Inc.	37-AA-0973	174
Escondido LVTO	Caltrans Region 2	37-AA-0976	15
Descanso LVTO	Caltrans Region 1	37-AA-0977	15
Boulevard LVTO	Caltrans Region 1	37-AA-0978	15
Carlsbad LVTO	Caltrans Region 2	37-AA-0979	15
Chula Vista LVTO	Caltrans Region 2	37-AA-0980	15
Santee LVTO	Caltrans Region 1	37-AA-0981	15
Caltrans Henshaw LVTO	Caltrans Region 1	37-AA-0983	15
Benchmark Landscape – Poway Branch	Benchmark Landscape – Poway Branch	37-AA-0985	2
Benchmark Landscape – San Marcos	Benchmark Landscape – San Marcos Branch	37-AA-0986	1
Benchmark Landscape – Spring Valley	Benchmark Landscape – Spring Valley	37-AA-0987	1
City of San Diego Env. Ser. Dept. LVTO	City of San Diego (Refuse Collection)	37-AB-0010	80
Waste Management North Co. Limited Col. Trans Op.	Waste Management Inc. North County	37-AA-0958	15
Allan Company MRF & T/S	Cedarwood-Young Company, dba Allan Co.	37-AB-0016	1,000
Coronado Bridge Paint LVTO	California Department of Transportation	37-AB-0018	15
Kearny Mesa LVTO	California Department of Transportation	37-AB-0023	15
Terra Bella Nursery, Inc.	Terra Bella Nursery, Inc.	37-AB-0024	199
Miramar Greenery	City of San Diego	37-AB-0003	690
West Miramar Sanitary Landfill	City of San Diego	37-AA-0020	8,000
Total			**23,411**

Source: CalRecycle 2021a.

Recycling, Composting, Chipping, and Grinding

The implementation of recycling, composting, chipping, and grinding practices reduces the amount of material that must be sent to the landfill. There are over 80 recycling centers in the San Diego region that collect recyclable materials (CalRecycle 2021c). In addition, three composting facilities in the region collect, grind, mix, pile, and add moisture and air to organic materials to speed natural decay and produce a soil amendment, and another four chipping and grinding facilities in the region are designed to reduce the size of compostable material (CalRecycle 2021d). One organics processing facility is also permitted in the County (CalRecycle 2021d).

Construction and Demolition and Inert Debris Facilities

Construction and demolition (C&D) material and inert debris are solid waste that pose a potential threat to public health and safety and the environment, and must be handled differently from municipal solid waste. C&D materials include lumber, drywall, glass, metal, roofing material, tile, carpeting and floor coverings, piping, concrete, cardboard and other packaging materials, dirt, and rock. Of these materials, metals are recycled the most, while lumber is most commonly sent to the landfill. According to the *2014 Disposal Facility-Based Characterization of Solid Waste in California,* C&D materials are estimated to account for between 21.7 to 25.5 percent of the disposed waste stream in the state (CalRecycle 2021e). There are 19 C&D recyclers in San Diego, 1 large processing facility, 3 medium processing facilities, and 4 inert fill-disposal operations (CalRecycle 2021c). According to CalRecycle, the San Diego region diverted 65,546 tons of C&D debris in 2018 from local landfills (CalRecycle 2021d).

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

Climate change could affect public services and utilities in a variety of ways, mainly due to damage to infrastructure or changes to operations. The San Diego region is likely to experience sea-level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix F.

Public Services

Climate change, particularly extreme events, could increase the demand on some public services, although the extent of this impact has not been quantified. For example, there could be more demand on public services to combat the increased severity and frequency of wildfires, extreme heat events, flooding, or landslides; this increased demand could conceivably require expanded or additional public service facilities. Moreover, the existing facilities themselves may experience impacts. Climate change could affect public services in the following ways:

- As temperatures warm and landscapes experience longer dry seasons, wildfire risks are likely to increase. More frequent or severe wildfires may strain existing fire-fighting capacity, requiring the expansion of fire stations or the addition of new facilities and operations.
- During extreme heat events, which are expected to become more severe, additional cooling centers may be required to prevent heat-related illnesses or fatalities. In 2017, a heat wave in the San Diego region closed 85 schools to protect children from the extreme heat (Kalansky et al. 2018). This type of event could

become more common, particularly threatening disadvantaged communities and vulnerable populations, including children, elderly, and homeless populations.

- Emergency response to severe events may require greater emergency management capacity from the region (Kalansky et al. 2018). Also, there may be a greater need for monitoring and assessments to provide hazard warning and preparation (Kalansky et al. 2018).
- Additionally, climate change conditions, such as sea-level rise and flooding, could contribute to deterioration or damage of existing public facilities. Across the state, damages due to inundation from 50 centimeters of sea-level rise could reach $18 billion dollars, some of which could include damages to public facilities, although the potential financial impact on public facilities has not been separately quantified (Kalansky et al. 2018).
- Climate change impacts may also damage recreational facilities and parks through destructive hazards such as wildfire, flooding, and landslides. Coastal parks and facilities, such as the Waterfront Park in the City of San Diego, may be particularly vulnerable to inundation from sea-level rise and coastal flooding (County of San Diego Parks and Recreation 2019).

More details on the effects of climate hazards on public services are provided in Appendix F.

Utilities

Utilities in the San Diego region, including wastewater collection and treatment, stormwater drainage, solid waste management systems, electric power, natural gas, and telecommunications facilities, may face risks and challenges from climate change. These impacts are described in the subsections below, with more detail in Appendix F.

Wastewater Collection and Treatment

Although no research was found on the impacts of climate change on wastewater treatment within the San Diego region, it is possible that higher temperatures would increase treatment costs or require changes in operations. The costs could increase because higher air and water temperatures reduce water quality and quantity by changing water chemistry, promoting bacterial growth, and increasing evapotranspiration (Duran-Encalada et al. 2017).

Both extreme precipitation and drought can cause challenges for wastewater treatment facilities. Extreme precipitation may cause more intense or frequent floods, which may overwhelm the current wastewater intake systems (Major et al. 2011). Drought conditions could reduce the inflow of water, which increases the concentration of pollutants, including salinity, in the wastewater treatment stream (Tran et al. 2017). Sea-level rise can also cause several problems for wastewater treatment, including overwhelming capacity and making treatment more difficult. As with extreme precipitation, sea-level rise could increase the risk of flooding or of overloading the treatment system.

Water quality in the watershed may be reduced after more frequent or intense wildfires due to erosion and sedimentation (EPA 2015). Although the impacts in the San Diego region were not specifically addressed in the literature, it is possible that degraded water quality from saltwater intrusion, greater contamination from pollutants, and sedimentation from wildfires may require more extensive water treatment processes to reach the required quality for discharge. Flooding and erosion exacerbated by climate change may present other physical risks to facilities and equipment of the utility. Erosion could wash away soils that support or cover infrastructure (ICLEI 2012), although this risk has not been quantified in the San Diego region.

Stormwater Drainage Facilities

Changes in the timing and intensity of precipitation, as well as sea-level rise, could affect stormwater management in the San Diego region (County of San Diego 2018c). While total annual precipitation may not change in the San Diego region, the pattern of precipitation may. More intense precipitation events could occur, and the San Diego region's current stormwater system may not be equipped to handle the quantity of runoff from a particular event (County of San Diego 2018c, Ascent Environmental Inc. 2017, Tuler 2016). When not sufficiently managed, stormwater can flood and erode roadways, and transport debris and sand can block drainage systems/culverts. If the stormwater system is overwhelmed, this could increase the likelihood or severity of flooding (Tuler 2016, Major et al. 2011).

According to ICLEI (2012), storm sewers around the San Diego Bay are highly vulnerable to flooding and inundation due to sea-level rise. Sea-level rise could exacerbate the flooding impacts of extreme precipitation. As sea levels rise, storm drain outfalls are inundated and unable to handle precipitation events (Tuler 2016). Due to impeded drainage, higher sea levels may exacerbate riverine flooding as well (Ascent Environmental Inc. 2017).

Solid Waste Management

Higher temperatures could have impacts on waste collection, processing, and disposal. Decomposition rates, odor, and pest activity may increase under higher temperatures, which could necessitate more frequent waste collection (USAID 2012). Also, higher temperatures could overheat collection vehicles or processing equipment (USAID 2012).

Extreme precipitation events could cause flooding along collection routes, access roads, and facilities (USAID 2012). Sea-level rise may narrow collection routes, damage low-lying processing facilities, and lead to material damage of coastal solid waste management facilities (USAID 2012). Flooding and erosion exacerbated by climate change may present other physical risks to facilities and equipment of the utility. Erosion could wash away soils that support or cover infrastructure (ICLEI 2012), although this risk has not been quantified in the San Diego region.

Energy Facilities

Climate change could contribute to the need for new or expanded energy facilities, although there is insufficient research to draw definitive conclusions about the extent to which climate change would do so. Climate change could contribute to this impact via the following ways:

- The projected increase in demand due to climate change (discussed above) could necessitate the building or expansion of additional generation facilities.
- Additional transmission capacity might be needed, not only due to additional load needing to be transmitted, but also because higher temperatures reduce the carrying capacity of the transmission lines—which in turn may lead to greater generation needs. According to Bartos et al. (2016), by mid-century (2040–2060) in the United States, increases in air temperature may reduce transmission capacity in the summer by 1.9–5.8 percent relative to the 1990–2010 base period. Simultaneously, peak summer loads may rise by 4.2–15.0 percent on average due to higher temperatures (Bartos et al. 2016).
- Higher temperatures can decrease generation capacity of natural gas-fired power plants, while increasing energy demand. Under a high emission scenario, generation capacity may decrease by 3–6 percent in

California and reduce transformer and substation capability by 2–4 percent (Sathaye et al. 2012). A decrease in generation capacity may necessitate the expansion/building of additional facilities.

- According to the County of San Diego's Climate Action Plan (2018), wildfire can damage electrical infrastructure, including severing transmission lines when fire comes in direct contact with the lines and affecting transmission capacity due to heat and smoke. Key transmission corridors are vulnerable to more frequent wildfires.
- Sea-level rise and increased storm frequency and/or intensity could affect coastal power plants, leading to flooding of some facilities. Additionally, offshore water intake pipes may be damaged by storm surge and debris (Perez 2009).

4.15.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Clean Water Act

The Clean Water Act (CWA) as it is known today was established in 1972 and is the basis for regulation of the discharge of pollution into the waters of the U.S. and regulation of surface water quality standards (33 USC 1251 et seq.). States are required to adopt water quality standards for all surface waters of the U.S., as detailed in Section 303. Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES), which regulates the discharge of pollutants from point sources. Municipal point sources consist primarily of domestic treated sewage and processed water, including municipal sewage treatment plant outfalls and stormwater conveyance system outfalls. These outfalls contain pollutants that are emitted directly into waters of the U.S. Without a permit, the discharge of pollutants from point sources into navigable waters of the U.S. is prohibited. NPDES permits require regular water quality monitoring. For a detailed discussion of the CWA see Section 4.10.2. Stormwater and wastewater discharges must meet water quality standards that are established pursuant to the CWA.

Resource Conservation and Recovery Act of 1976

Subtitle C of the Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave," and was designed to protect human health and the environment, reduce/eliminate the generation of hazardous waste, and conserve energy and natural resources; to reduce the amount of waste generated; and to ensure that wastes are managed in an environmentally sound manner. RCRA regulates the management of solid waste (e.g., garbage), hazardous waste, and underground storage tanks holding petroleum products or certain chemicals. Solid waste, as defined by RCRA, includes both hazardous and nonhazardous materials. RCRA establishes a framework for the management of nonhazardous waste in Subtitle D. Nonhazardous solid waste includes household garbage, sludge from waste treatment plants, construction debris, and various types of nonhazardous industrial waste. Subtitle D states the requirements for solid waste planning and encourages recycling and recovery programs that most directly affect state and regional solid waste management authorities. EPA also developed federal criteria for the proper design and operation of municipal solid waste landfills and other solid waste disposal facilities. EPA approved the State of California's program, a joint effort of the California Integrated Waste Management Board, SWRCB, RWQCBs, and LEAs, on October 7, 1993.

Department of Transportation Act Section 4f

Passed in 1966, the Department of Transportation Act includes Section 4(f), which states that the Federal Highway Administration and other Department of Transportation agencies cannot approve the use of land from public state parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless certain conditions apply. These exceptions are as follows: if there is no feasible and prudent avoidance alternative to the use of land, and if the action includes all possible planning to minimize harm to the property resulting from such use; or if the Administration determines that the use of the property will have a de minimis impact (49 USC 303).

National Energy Act of 1978

The National Energy Act of 1978 included the Public Utility Regulatory Policies Act (Public Law 95-617), Energy Tax Act (Public Law 95-318), National Energy Conservation Policy Act (Public Law 95-619), Power Plant and Industrial Fuel Use Act (Public Law 95-620), and the Natural Gas Policy Act (Public Law 95-621).

The intent of the National Energy Act was to promote greater use of renewable energy, provide residential consumers with energy conservation audits to encourage slower growth of electricity demand, and promote fuel efficiency. The Public Utility Regulatory Policies Act created a market for nonutility electric power producers to permit independent power producers to connect to their lines and to pay for the electricity that was delivered.

The Energy Tax Act promoted fuel efficiency and renewable energy through taxes and tax credits. The National Energy Conservation Policy Act required utilities to provide residential consumers with energy conservation audits and other services to encourage slower growth of electricity demand.

Energy Policy Act of 2005

This comprehensive energy legislation, signed in August 2005, contains several electricity-related provisions that aim to, among other things, to help ensure that consumers receive electricity over dependable, modern infrastructure, removes outdated obstacles to investment in electricity transmission lines, makes electricity reliability standards mandatory instead of optional, and gives federal officials the authority to site new power lines in DOE-designated national corridors in certain limited circumstances.

Telecommunications Act of 1996

The Telecommunications Act (47 USC Chapter 5) was the first major overhaul of telecommunications law in almost 62 years. The Act deregulates local phone service and allows long-distance carriers and cable television companies to provide local phone service and local telephone companies to provide long distance service. Section 706 of the Act requires that the FCC determine annually whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion, and assesses the impact of the FCC's policies on broadband deployment.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

California Mutual Aid Plan

The California Governor's Office of Emergency Services' (CAL OES) Mutual Aid Plan establishes policies, procedures, and responsibilities for requesting and providing inter- and intra-agency assistance in

emergencies. The plan directs local agencies to develop automatic or mutual aid agreements, or to enter into agreements for assistance by hire (e.g., Schedule A contracts) where local needs are not met by the framework established by the Mutual Aid Plan (Cal OES 2019).

Assembly Bill 16

Assembly Bill (AB) 16 was passed in 2002 and created the Critically Overcrowded School Facilities program to supplement the construction provisions within the School Facilities Program (SFP). The SFP provides State funding assistance for new construction and modernization of facilities. The Critically Overcrowded School Facilities program allows school districts that have been determined by the California Department of Education to have critically overcrowded facilities to apply for new construction projects without meeting all SFP program requirements. Districts with SFP new construction eligibility and school sites included on a California Department of Education list of source schools may apply (Chapter 33, Statutes of 2002).

Senate Bill 50 – Leroy F Greene Schools Facilities Act of 1998

Senate Bill (SB) 50, or the Leroy F. Greene School Facilities Act of 1998, restricts the ability of local agencies to deny project approvals on the basis that public school facilities (classrooms, auditoriums, etc.) are inadequate. School impact fees are collected at the time when building permits are issued. Payment of school fees are also collected at the time when building permits are issued. Payment of school fees is required by SB 50 for all new residential development projects and is considered "full and complete mitigation" of any school impacts. School impact fees are payments to offset capital cost impacts associated with new developments, which result primarily from costs of additional facilities, related furnishings and equipment, and projected capital maintenance requirements. As such, agencies cannot require additional mitigation for any school impacts (Chapter 407, Statutes of 1998).

Senate Bill 1389, Chapter 568, Statutes of 2002

The CEC is responsible for, among other things, forecasting future energy needs for the state and developing renewable energy resources and alternative renewable energy technologies for buildings, industry, and transportation. Senate Bill (SB) 1389 (Chapter 568, Statutes of 2002) requires the CEC to prepare a biennial integrated energy policy report assessing major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors. The report also provides policy recommendations to conserve resources, protect the environment, and ensure reliable, secure, and diverse energy supplies. The 2019 Integrated Energy Policy Report was adopted in February 2020. Energy topics covered in the report include decarbonizing buildings, integrating renewables, energy efficiency, energy equity, integrating renewable energy, updates on Southern California electricity reliability, climate adaptation activities for the energy sector, natural gas assessment, transportation energy demand forecast, and the California Energy Demand Forecast (CEC 2020). The 2020 draft Integrated Energy Policy Report Update was released in January 2021.

California Building Standards Code (Title 24, CCR)

Building Standards Code Title 24 applies to all buildings throughout the State of California and includes requirements for structural, mechanical, electrical, and plumbing systems, and requires measures for energy conservation, green design, construction and maintenance, and fire and life safety and accessibility (24 CCR). Cities and counties are required by State law to enforce Title 24; however, they can adopt more restrictive ordinances.

California Rules for Overhead Electrical Line Construction

These rules prescribed by the Public Utilities Commission of the State of California under General Order No. 95 sets requirements for overhead line design, construction, and maintenance. Rules were last updated in January 2015.

California Government Code 4216 through 4216.9, Protection of Underground Infrastructure

California Government Code 4216 through 4216.9 requires an excavator to notify appropriate known operators of subsurface installations within the delineated boundaries of a proposed area of excavation, as provided.

Quimby Act and AB 1359

Cities and counties have been authorized since the passage of the 1975 Quimby Act (Government Code Section 66477) to pass ordinances requiring that developers set aside land, donate conservation easements, or pay fees for park improvements. Revenues generated through the Quimby Act cannot be used for the operation and maintenance of park facilities. The dedicated land or fees may only be used for the development or rehabilitation of neighborhood or community parks or recreational facilities in the subdivision they were provided for, according to AB 1359 (Chapter 412, Statutes of 2013), unless certain requirements are met and an exception is made. The goal of the Quimby Act is to require developers to help mitigate the impacts of property improvements. The act gives authority for passage of land dedication ordinances only to cities and counties. Special districts must work with cities and/or counties to receive parkland dedication and/or in-lieu fees. The fees must be paid and land conveyed directly to the local public agencies that provide park and recreation services communitywide.

California Coastal Act, Coastal Recreation Policies

California Coastal Act policies related to coastal recreation include Public Resources Code Section 30210, which requires that maximum access and recreational opportunities shall be provided for all people, and Section 30213, which protects lower cost visitor and recreational facilities, and encourages the provision of pubic recreational opportunities.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Water Code, Division 7) was instated to regulate activities and factors that may affect the quality of the waters of the State of California, to protect the health, safety, and welfare of the people. It charges the State with the act of protecting the waters from degradation and established nine RWQCBs throughout the state. The Act declares that the SWRCB and each RWQCB will have the primary responsibility for water quality control. Each RWQCB is in charge of updating their water quality control plans, known as Basin Plans. They also regulate pollutant or nuisance discharges that may affect surface or groundwater. Stormwater and wastewater discharges must meet water quality standards that are established in Basin Plans.

State Water Resources Control Board

The SWRCB issues individual and general NPDES permits for wastewater and stormwater through authorization of the EPA. Discharges that may impact surface or groundwater, and which are not regulated by an NPDES permit, are issued a waste discharge requirement (WDR) that serves as a permit under the authority

of the California Water Code. The RWQCBs issue Land Disposal WDRs that permit certain solid and liquid waste discharges to land to ensure that wastes do not reach surface water or groundwater. Land Disposal WDRs contain requirements for liners, covers, monitoring, cleanup, and closure. The RWQCBs also permit certain point source discharges of waste to land that have the potential to affect surface or groundwater quality. This category of discharges, known as "Non-15" WDR, is the most diverse and includes sewage sludge and biosolids, industrial wastewater from power plants, wastes from water supply treatment plants, treated wastewater for aquifer storage and recovery, treated groundwater from cleanup sites, and many others.

Related to wastewater collection and treatment facilities, stormwater drainage facilities, and landfills, the SWRCB has issued the following orders:

- California Department of Transportation (Caltrans) NPDES Permit (Order 99-06-DWQ): Requires Caltrans to regulate nonpoint source discharge from its properties, facilities, and activities. Among other requirements, Caltrans must annually update an enforceable Stormwater Management Plan (SWMP). See Section 4.10, for more detail.
- Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (Order No. 2006-0003-DWQ): Requires all federal and State agencies, municipalities, counties, districts, and other public entities that own, operate, or are otherwise responsible for sanitary sewer systems greater than 1 mile in length that collect and/or convey untreated wastewater to a publicly owned treatment facility in California to prepare sewer system management plans and report all sanitary sewer overflows (SSOs) to the SWRCB. Order No. WQ 2008-0002-EXEC, amended the statewide Monitoring and Reporting Program for SSOs that reach surface waters or storm drains. The RWQCB issued Order No. R9-2007-0005 to reaffirm the prohibition of SSOs upstream of a wastewater treatment facility.

Water Quality Control Policy for Siting, Design, Operation and Maintenance of Onsite Wastewater Treatment Systems (OWTS) (Title 23, CCR)

AB 885 (Chapter 781, Statutes of 2000) required that the SWRCB, along with other interested parties, adopt specified regulations or standards for the permitting and operation of prescribed onsite wastewater treatment systems (OWTS). Each RWQCB must incorporate the new standards and regulations into their regional water quality control plans. Resolution R9-2015-0008, adopted in April 2015, incorporated the OWTS policy into the San Diego Water Quality Control Plan, and Resolution No. 2018-0019 amended the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (the "OWTS Policy") in CCR Title 23 (SWRCB 2018). Onsite wastewater treatment systems allow habitation in locations that are far from central wastewater treatment plants, such as areas of the unincorporated County. OWTS can help to reduce the strain on municipal wastewater facilities and reduce the need for construction of new facilities in these remote areas. The OWTS policy helps to reduce an OWTS' impact on the environment where they are used.

San Diego Regional Municipal Storm Water Permit

An MS4 is defined as a conveyance or system of conveyances (e.g., municipal streets, catch basins, gutters, storm drains, etc.) used for collecting or conveying stormwater that is not a combined sewer or connected to a publicly owned treatment network. The San Diego Municipal Storm Water Permit (Order R9-2013-0001) (as amended by Order No. R9-2015-0001 and R9-2015-0100) (Municipal Permit) regulates the conditions under which stormwater and non-stormwater discharges into and from MS4s are prohibited or limited (RWQCB 2018). The 18 cities, County government, San Diego County Regional Airport Authority, San Diego Unified Port District, Del Mar Fairgrounds, and the University of California, San Diego each owns or operates an MS4, through which it

discharges stormwater and non-stormwater into waters of the U.S. within the San Diego region. These entities are the San Diego County Copermittees (Copermittees) who, along with the Orange County Copermittees, are subject to the requirements of the permit. The Caltrans stormwater system is regulated separately under the Caltrans NPDES permit, as described below.

This permit requires each of the Copermittees to prepare a Jurisdictional Urban Runoff Management Program (JURMP) to control the contribution of pollutants to and the discharges from the MS4. Each of these JURMPs includes a component addressing construction activities, development planning, and existing development. In accordance with the provisions of the Municipal Permit, the County of San Diego developed the County of San Diego BMP Design Manual (County of San Diego 2018b). The County's BMP Design Manual establishes a series of source control, site design, and treatment control best management practices (BMPs) that are to be implemented by all Priority Development Projects (PDPs). PDPs include new development; redevelopment projects that create, add, or replace 5,000 square feet; and pollutant generating projects. Each jurisdiction within San Diego County (i.e., the Copermittees of the Municipal Permit) has adopted their own stormwater standards.

San Diego Regional Water Quality Control Board Basin Plan

The Water Quality Control Plan for the San Diego Basin, also known as the Basin Plan, establishes water quality objectives and implementation strategies to protect the beneficial uses of water bodies in the San Diego region, and describes monitoring plans to assess its effectiveness (RWQCB 2016). Beneficial uses are defined as "the uses of water necessary for the survival and well-being of man, plants, and wildlife," and promote the economic, social, and environmental goals of mankind. Policies in the Basin Plan define treatment levels of water that must be met by regional wastewater facilities.

Integrated Waste Management Act of 1989 (AB 939)

AB 939 (Chapter 1095, Statutes of 1989) requires each city and county in California to develop Integrated Waste Management Plans (IWMPs) to divert 25 percent of its waste stream by 1995, and 50 percent by 2000, with the base year set as 1990. The passage of SB 1016 changed the way that waste disposal is measured. As of 2007, the diversion requirement is only measured in pounds per person per day (CalRecycle 2018d). The goal of AB 939 is to reduce dependence on landfills for waste disposal. The Act established a hierarchy of priority for waste management: (1) source reduction (waste prevention), to reduce the amount of waste generated at its source; (2) recycling (or reuse) and composting; (3) transformation; and (4) disposal by landfilling. See below for a discussion of the IWMP for the San Diego Region.

AB 341

Legislation enacted in 2011 (AB 341, Chesbro, Chapter 476, Public Resources Code Section 42926(a)) changed the due date of the State agency waste management annual report to May 1 beginning in 2012. The bill makes a legislative declaration that it is the policy goal of the State of California that not less than 75 percent of solid waste generated be source reduced, recycled, or composted by the year 2020. AB 341 also requires the provision of recycling service to commercial facilities that generate 4 cubic yards or more of solid waste per week, and to multifamily facilities with five or more units.

AB 1826

AB 1826 Chesbro (Chapter 727, Statutes of 2014), requires businesses, including State agencies, to recycle their organic waste on and after April 1, 2016, depending on the amount of organic waste they generate per week.

Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste. For businesses that generate 8 or more cubic yards of organic waste per week, this requirement began on April 1, 2016, while those that generate 4 cubic yards of organic waste per week must have had an organic waste recycling program in place beginning January 1, 2017. The requirement becomes more stringent in following years. Multifamily properties are regulated, but are only required to divert green waste and non-hazardous wood waste. This law also requires local jurisdictions across the state to implement an organic waste recycling program to divert organic waste generated by businesses, including certain multifamily residential dwellings, as described above, starting on January 1, 2016. In September 2020, CalRecycle extended the organic waste recycling requirements to businesses that generate 2 cubic yards or more of commercial solid waste (total trash, recyclables, and organics) per week.

AB 2396

As of January 1, 2017, pursuant to AB 2396 (McCarty, Chapter 466, Statutes of 2016), each State agency is required to include in its existing annual report to CalRecycle specified information on the State agency's compliance with mandatory commercial recycling requirements, pursuant to AB 341, and mandatory commercial organics recycling requirements, pursuant to AB 1826.

AB 2812

Effective July 1, 2018, State agencies must provide adequate recycling and organics recycling containers to collect waste generated. Containers should be placed adjacent to trash containers and be visible, easily accessible, and clearly marked.

CalRecycle Regulations

CalRecycle regulations pertaining to nonhazardous waste management in California include minimum standards for solid waste handling and disposal; regulatory requirements for composting operations; standards for handling and disposal of asbestos-containing waste; resource conservation programs; enforcement of solid waste standards and administration of solid waste facility permits; permitting of waste tire facilities and waste tire hauler registration; special waste standards; used oil recycling program; electronic waste recovery and recycling; planning guidelines and procedures for preparing, revising, and amending countywide IWMPs; and solid waste cleanup program (14 CCR Division 7).

CALGreen Construction Waste Diversion

The California Green Building Standards Code (CALGreen) mandates locally permitted new residential and non-residential building construction, demolition and certain additions and alteration projects to recycle and/or salvage for reuse a minimum 65 precent of the nonhazardous construction and demolition waste or meet a local C&D waste management ordinance, whichever is more stringent.

Caltrans Highway Design Manual

The Caltrans Highway Design Manual was developed to be a set of policies and procedures to carry out the highway design functions of Caltrans. While this manual does not instate a legal standard, it does provide guidance and uniform standards related to design and construction of Caltrans facilities. These standards include consideration of runoff and controlling it through hydraulic design of drainage features (Caltrans 2018).

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

County of San Diego Fire Protection Ordinance No. 10172

This ordinance ratified the 2011 Consolidated Fire Code for the 16 FPDs in the unincorporated County. Each FPD can modify the code based on specific needs for their jurisdiction. The County Fire Code applies to both ministerial and discretionary projects and both new and repair projects. The County Fire Code is amended every 3 years in conjunction with the revised California Building Standards Code.

Wastewater Agency Management Plans

The municipalities and water districts with the responsibility for wastewater/sewer services have a variety of management plans for these utilities.

The County of San Diego developed a Sewer System Management Plan (SSMP) to document management of their wastewater collection system (County of San Diego 2015). The SSMP provides a summary of the action plan implemented to comply with the sanitary sewer system requirements imposed by the WDRs and other governing agencies. It includes a description of the activities and procedures that personnel follow to implement the various programs encompassed in the overall efforts to efficiently manage, operate, and maintain the sanitary sewer system and facilitate the reduction and potential elimination of SSOs. The goals of the SSMP include the following:

- Minimizing the frequency and impact of SSOs.
- Effectively and efficiently mitigating the impacts of SSOs should they occur.
- Providing adequate sewer capacity to convey peak flows.
- Maintaining and improving the condition of the collection system infrastructure to provide continual reliable service.
- Engaging and educating the public regarding programs and issues related to the wastewater collection system.

San Diego Integrated Waste Management Plan

The County of San Diego prepares the IWMP for the San Diego region. The IWMP includes the following elements: Source Reduction and Recycling, Household Hazardous Waste, Non-Disposal Facility, and Countywide Siting. The Countywide Siting Element must demonstrate at least 15 years of remaining disposal capacity. It includes various strategies to demonstrate the remaining capacity, such as existing, proposed, and tentative landfills or landfill expansions; increased diversion efforts; and the export of solid waste disposal. In the San Diego region, the Countywide Siting Element must be updated every 5 years, and must be adopted by the County Board of Supervisors and a majority of the cities within San Diego County. A 5-year review of the Countywide IWMP was completed in 2018, which determined that updates to the Countywide Summary Plan or the Countywide Siting Element planning documents were not warranted (County of San Diego 2018a). Under the law SANDAG is designated as the region's Integrated Waste Management Local Task Force responsible for advising and assisting the cities and County with certain aspects of compliance with AB 939.

Solid Waste Reduction Plans

A number of jurisdictions within the San Diego region have developed solid waste reduction plans that designate waste reduction targets. For example, the City of San Diego Environmental Services Department has developed a zero waste plan for the City of San Diego that is designed to divert waste from landfill disposal. The plan calls for 75 percent diversion by 2020 and 90 percent diversion by 2035, and for zero waste to be disposed of in landfills by 2040 (City of San Diego 2015b). One of the goals of the plan is to promote local policies and ordinances as well as legislation at the State level that encourages manufacturers, consumers, and waste producers to be responsible for waste. The County of San Diego developed a Strategic Plan to Reduce Waste (County of San Diego 2017), that calls for 75 percent diversion by 2020. The County is in the process of updating its Solid Waste Ordinance in response to the State's updated waste diversion goals, such as the AB 1826 regulations. Other jurisdictions, such as the City of Encinitas, have incorporated goals to develop waste reduction strategies into climate action plans (City of Encinitas 2020). In response to CALGreen C&D Diversion mandates, local jurisdictions have also adopted C&D ordinances.

County and City General Plans

The County and cities' General Plans establish policies for a number of topics relevant to public services and utilities, including fire prevention, law enforcement, schools, libraries, parks and recreational facilities, solid waste, stormwater and sewer infrastructure. General Plan policies related to public services and utilities include implementation of funding and management strategies for public infrastructure projects, and planning policies to identify demand for new facilities and their design and construction. Policies related to police and fire-rescue can include identification of response times or other staffing goals, and characterization of standards for facilities and equipment. Beyond its General Plan, the County has developed a Parks Master Plan and Community Trails Master Plan and implements its Parkland Dedication Ordinance to plan for and fund park and recreation expansions in conjunction with population growth. Other jurisdictions in the County have also conducted master planning to identify future park and recreation needs and expansion opportunities. In 2017, the California Governor's Office of Planning and Research completed the first comprehensive update to the General Plan Guidelines since 2003. One of the major changes includes an expanded section addressing the need for additional recycling, anaerobic digestion, composting, and remanufacturing facilities in the land use element of general plans.

4.15.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the checklist questions that address the criteria in Appendix G. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR and the unique characteristics of the proposed Plan.

Checklist questions for public services and utilities are included in three sections of the CEQA Guidelines Appendix G checklist: Public Services (XIV), Recreation (VXI), and Utilities and Service Systems (XIX). For purposes of this EIR, the Appendix G questions have been combined and modified. Specifically, Appendix G Section XIV, Public Services, question (a), and Section XVI, Recreation, question (b) have been combined into PS-1. Section XVI, Recreation, question (a) is included as REC-1. Section XIX, Utilities and Service Systems, questions (a) and (c) are combined in U-1. Section XIX, Utilities and Service Systems, questions (d) and (e) are combined in U-2. Section XIX, Utilities and Service Systems, question (b) is included in Section 4.18.

Implementation of the proposed Plan would have a significant public services and utilities impact if it would:

PS-1	Result in substantial adverse physical impacts associated with the provision of or need for new or physically altered (i.e., expanded) public facilities, in order to maintain adequate fire and police protection, emergency services, schools, libraries, and recreation facilities.
REC-1	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
U-1	Result in the expansion, relocation, or construction of wastewater collection and treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities to adequately meet projected capacity needs, the construction of which could cause significant environmental impacts.
U-2	Generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure; negatively impact the provision of solid waste services or impair the attainment of solid waste reduction goals; or fail to comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

4.15.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

PS-1 RESULT IN SUBSTANTIAL ADVERSE PHYSICAL IMPACTS ASSOCIATED WITH THE PROVISION OF OR NEED FOR NEW OR PHYSICALLY ALTERED (I.E., EXPANDED) PUBLIC FACILITIES, IN ORDER TO MAINTAIN ADEQUATE FIRE AND POLICE PROTECTION, EMERGENCY SERVICES, SCHOOLS, LIBRARIES, AND RECREATION FACILITIES

ANALYSIS METHODOLOGY

This section analyzes impacts associated with the provision of or need for new or physically altered public facilities in order to maintain adequate public services under the proposed Plan. A significant impact would occur if forecasted regional growth and land use change or planned transportation network improvements required construction or expansion of facilities to maintain adequate levels of service for fire and police protection, emergency services, schools, libraries, and recreation facilities, that would result in adverse physical impacts. Impacts of construction activities for new or expanded facilities are analyzed as well. Additional information about impacts on fire protection related to wildfire is included in Section 4.19, *Wildfire*.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, regional growth is forecasted to result in an increase of 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). The 2025 regional land use pattern is shown in Figure 2-17. Approximately 78.8 percent of the 2025 population growth would occur within the City of San Diego (57.9 percent), City of Chula Vista (12 percent), and City of Escondido (8.8 percent). Collectively, these three jurisdictions would accommodate approximately 78 percent of new housing units and 63 percent of new jobs, respectively, by 2025. In these cities, higher levels of public services would be needed, while demand for public services would increase throughout the region in response to forecasted growth and increased risk from wildfires, as discussed in Section 4.19. As discussed in Chapter 2, *Project Description*, the SCS land use pattern concentrates development into either Mobility Hub or Smart Growth Opportunity Areas.

To meet increased demand for public services due to forecasted regional growth, additional fire and police personnel, equipment, and facilities would likely be needed to maintain adequate response times and service ratios to protect the health and safety of people and to protect property in areas of new growth and increased density. In areas of new growth, new facilities such as police and fire stations would be needed to protect the new infrastructure and population, while the increased population in developed areas would require both new facilities and physical expansion of existing facilities. Where growth occurs outside of existing service areas, response times to those areas would be longer and would be out of compliance with service standards unless new or expanded facilities are constructed.

Based on forecasted population and housing unit growth by 2025, schools, libraries, and recreational facilities would also experience facility deficiencies and would require new or expanded facilities to maintain current levels of service as population increases. As the population grows, use of these facilities would increase. Schools and libraries would become overcrowded, and recreation areas would become overused and degraded if no new or expanded facilities are constructed. The need for these facilities would be concentrated in residential areas, because demand for these public services is driven by population growth, while demand for fire and police protection facilities and emergency services is created by both residential and non-residential land use types.

Throughout the San Diego region, the construction of new public facilities or expansion of existing public facilities would likely be needed to maintain existing (2016) service levels for fire protection, police protection, emergency services, schools, libraries, and recreational facilities in the year 2025. Individual service providers are responsible for identifying service deficiencies based upon their adopted performance measures or services standards for determining the adequacy of existing public services, and deciding when and where to expand existing facilities or provide new facilities. Payment of school fees, as required by SB 50, for all new residential projects would fully mitigate school impacts for a portion of the population and housing growth projected in 2025. Other public facilities or expansions are funded through Facilities Benefit Assessment fees, Development Impact Fees, Mello Roos fees and other public funding mechanisms assessed at the time development projects are approved.

The provision of new facilities or expansion of existing governmental facilities would result in short-term construction-related impacts and long-term operational impacts, for such resource areas as air quality, noise, and traffic, among others. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs. Because details are not known about timing, location, and other project-specific information for new or expanded facilities, it cannot be guaranteed that impacts from the construction and operation of new or physically altered governmental facilities would be less than significant for all projects. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

New transportation network improvements and programs, such as additions to existing highways, rail corridors, or local roads located in established communities, would generally require little to no increase in police and fire protection and emergency services, and would not cause deterioration of the facilities that provide police, fire, and emergency services compared to existing (2016) conditions. Construction of network improvements would maintain emergency access to construction work sites, and nearby businesses, schools, hospitals, and medical facilities near construction site. All construction activities, including roadway closures, would be coordinated with police and fire protection, and emergency services to prevent service delays or disruptions. The operation of the transportation network improvements and programs would not increase use

of fire, emergency, and police services due to increased accidents, injuries, and collisions, because improvements would be required to conform to the design standards of the public agency responsible for implementation in order to minimize hazardous conflicts and conditions that could contribute to collisions and other safety hazards, as discussed in additional detail in Section 4.16, *Transportation*. Transit service expansions would introduce new facilities, such as stations and park and ride facilities, which would require police, fire, and emergency service protection; however, the proposed Plan would not significantly affect response times or exceed the capacity of the local service providers. Therefore, the need for fire, emergency, and police services and facilities would not substantially increase as a result of planned transportation network improvements and programs.

As a result, the construction and operation of transportation network improvements would require minor or no use of public services or facilities, except for transportation network improvements at Mobility Hubs where stations would be constructed and linked with active transportation improvements and a concentration of flexible transportation services due to incentivized transportation infrastructure. Demand for public services and facilities is typically driven by new population, housing, and job growth as described above, and not by transportation network improvements or programs. Therefore, the construction and operation of transportation improvements and programs would not increase demand for schools, libraries, and recreational facilities such that new or physically altered facilities would be required in order to maintain adequate facilities or levels of service.

Based upon the current level and pattern of fire, emergency, and police protection within the region transportation network improvements and programs identified in the proposed Plan would not create demand for additional increases of police and fire protection and emergency services beyond the demand for such services created by regional growth, and would not create the need for new or expanded school, library, or recreational facilities. Therefore, transportation network improvements and programs would have a less-than-significant impact.

2025 Conclusion

Implementation of regional growth and land use changes, but not transportation network improvements and programs, would result in substantial adverse physical impacts associated with the substantial physical deterioration of existing facilities and the construction of new or expanded public facilities. Therefore, this impact (PS-1) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional growth is forecasted to result in an increase of 149,500 people (4.3 percent), 121,650 housing units (9.4 percent), and 159,728 jobs (9 percent). The 2035 regional land use pattern is shown in Figure 2-18. Approximately 78 percent of the 2035 population growth would occur in the City of San Diego (70.9 percent) and City of National City (7.3 percent). These two jurisdictions would account for approximately 73 percent of new housing units and 60 percent of new jobs, respectively, by 2035. In these cities, higher levels of public services would be needed, while demand for public services would increase throughout the region in response to forecasted growth and increased risk from wildfires, as discussed in Section 4.19.

While some areas would experience a higher percent increase than others, there would be additional demand for public services throughout the region. In areas of new growth, new facilities such as police and fire stations

would be needed to protect the new infrastructure and population, while the increased population in developed areas would require both new facilities and physical expansion of existing facilities. Where growth occurs outside of existing service areas, response times to those areas would be longer and would be out of compliance with service standards unless new or expanded facilities are constructed.

The provision of new facilities or expansion of existing governmental facilities would result in short-term construction-related impacts and long-term operational impacts, for such resource areas as air quality, noise, and traffic, among others. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs. Because details are not known about timing, location, and other project-specific information for new or expanded facilities, it cannot be guaranteed that impacts from the construction and operation of new or physically altered governmental facilities would be less than significant for all projects. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

Between 2026 and 2035, additional transportation network improvements and programs are proposed in areas throughout the region that are currently served by different public service providers. However, as described in the 2025 analysis, none of the proposed transportation network improvements and programs would create new demand for public services beyond the level of demand created by new regional growth that would result in substantial physical deterioration of existing facilities or require new or physically altered governmental facilities. Mobility Hubs improvements, particularly at the Central Mobility Hub and San Ysidro Mobility Hub, are not anticipated to create new demand for public services and facilities because that demand is typically driven by new population, housing, and job growth as described above, and not by transportation network improvements or programs. Therefore, transportation network improvements and programs would have a less-than-significant impact.

2035 Conclusion

Implementation of regional growth and land use changes, but not transportation network improvements and programs, would result in substantial adverse physical impacts associated with the substantial physical deterioration of existing facilities and the construction of new or expanded public facilities. Therefore, this impact (PS-1) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, regional growth is forecasted to result in an increase of 125,725 people (3.4 percent), 61,433 housing units (4.3 percent), and 164,843 jobs (8.5 percent). The 2035 regional land use pattern is shown in Figure 2-19. Approximately 78 percent of the 2035 population would occur in the City of San Diego (37 percent), City of Chula Vista (28 percent), and City of San Marcos (13 percent). Collectively, these three jurisdictions would accommodate approximately 89 percent of new housing units and 72 percent of new jobs, respectively, by 2050. In these cities, higher levels of public services would be needed, while demand for public services would increase throughout the region in response to forecasted growth and increased risk from wildfires, as discussed in Section 4.19.

While some areas would experience a higher percent increase than others, there would be additional demand for public services throughout the region. In areas of new growth, new facilities such as police and fire stations

would be needed to protect the new infrastructure and population, while the increased population in developed areas would require both new facilities and physical expansion of existing facilities. Where growth occurs outside of existing service areas, response times to those areas would be longer and would be out of compliance with service standards unless new or expanded facilities are constructed.

The provision of new facilities or expansion of existing governmental facilities would result in short-term construction-related impacts and long-term operational impacts on such resource areas as air quality, noise, and traffic, among others. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs. Because details are not known about timing, location, and other project-specific information for new or expanded facilities, it cannot be guaranteed that impacts from the construction and operation of new or physically altered governmental facilities would be less than significant for all projects. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

Between 2036 and 2050, additional transportation network improvements and programs are proposed in areas throughout the region that are currently served by different public service providers. However, as is true in the 2025 and 2035 analyses, none of the proposed transportation network improvements and programs would create new demand for public services beyond the level of demand created by new regional growth that would result in substantial physical deterioration of existing facilities or require new or physically altered governmental facilities. Mobility Hubs improvements are not anticipated to create new demand for public services and facilities since that demand is typically driven by new population, housing, and job growth as described above, and not by transportation network improvements or programs. Therefore, transportation network improvements and programs would have a less-than-significant impact.

2050 Conclusion

Implementation of regional growth and land use change, but not transportation network improvements and programs, would result in substantial adverse physical impacts associated with the substantial physical deterioration of existing facilities and the construction of new or expanded public facilities. Therefore, this impact (PS-1) in the year 2050 is significant.

Exacerbation of Climate Change Effects

The proposed Plan could potentially exacerbate climate change effects on the need for new or physically altered public facilities. Climate change is expected to increase the risk of several hazards, such as extreme heat, wildfire, and flooding, all of which pose a threat to human health and safety or to structures. Increased incidence of these risks due to climate change may strain current capacity of fire and police protection, emergency services, and recreation facilities (such as cooling centers) and thus eventually spur development of new facilities to meet demand for public services (Kalansky et al. 2018). The proposed Plan is also expected to result in substantial adverse physical impacts to existing facilities that may necessitate construction of new or expanded facilities; this could contribute to impacts on existing facilities the region is already expected to see under climate change. However, it is uncertain to what degree climate change could spur development of new facilities, because it depends on decision-making surrounding implementation of climate adaptation measures; public services providers may not decide to construct additional public service facilities in reaction to increased climate change hazards.

MITIGATION MEASURES

PS-1 RESULT IN SUBSTANTIAL ADVERSE PHYSICAL IMPACTS ASSOCIATED WITH THE PROVISION OF OR NEED FOR NEW OR PHYSICALLY ALTERED (I.E., EXPANDED) PUBLIC FACILITIES, IN ORDER TO MAINTAIN ADEQUATE FIRE AND POLICE PROTECTION, EMERGENCY SERVICES, SCHOOLS, LIBRARIES, AND RECREATION FACILITIES

2025, 2035, and 2050

PS-1 Implement Mitigation Measures for New/Expanded Public Service Facilities. During planning, design, and project-level CEQA review of development of public facilities projects, the County of San Diego, cities, and other public service providers can and should implement mitigation measures to avoid or reduce significant environmental impacts associated with the construction of new or expanded public facilities. Mitigation measures should be implemented by public service providers directly responsible for the construction or expansion activities. Significant environmental impacts requiring mitigation may include, but are not limited to, agricultural resources, air quality, biological resources, cultural resources, greenhouse gas emissions, hydrology and water quality, noise, paleontological resources, transportation, tribal cultural resources, and water supply. Mitigation measures may be similar to those described in this EIR for construction of development projects and transportation network improvements.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of the proposed Plan would result in significant impacts associated with the construction or expansion of public facilities by 2025, 2035, and 2050 in order to maintain necessary service ratios and performance standards. Mitigation measure PS-1 would reduce the impacts of project-specific construction or expansion through project-level planning, design, and CEQA mitigation measures. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, this impact (PS-1) would remain significant and unavoidable.

REC-1 INCREASE THE USE OF EXISTING NEIGHBORHOOD AND REGIONAL PARKS OR OTHER RECREATIONAL FACILITIES SUCH THAT SUBSTANTIAL PHYSICAL DETERIORATION OF THE FACILITY WOULD OCCUR OR BE ACCELERATED

ANALYSIS METHODOLOGY

This section analyzes impacts associated with an increase in the use of parks and recreational facilities that would cause accelerated substantial deterioration under the proposed Plan. A significant impact would occur if forecasted regional growth and land use change or planned transportation network improvements and programs resulted in increased use of parks or other recreational facilities, in a manner that would result in or accelerate substantial physical deterioration of those facilities. To evaluate potential impacts, areas where regional growth and land use change are expected to occur and locations of planned transportation projects are compared to the existing open space park lands (i.e., conserved lands) and recreational lands (i.e., parks) identified in Section 4.15.1, *Existing Conditions,* to determine if implementation of the proposed Plan would accelerate or result in substantial physical deterioration of parks or other facilities.

Physical deterioration is likely to occur when parks and recreation facilities are overused. Overuse would likely result when a greater number of people are using the same amount of parks and recreational facilities leading

to the accelerated deterioration of existing facilities. Physical deterioration would also occur without the acquisition of new parks and recreational facilities or increased maintenance of existing parks and facilities or a decrease in land dedicated to open space or parkland use. However, local jurisdictions have the means to acquire, develop, and maintain parkland and recreation facilities in the future through the funding mechanisms described in Section 4.15.2, and through the laws, regulations, and local plans described in this section. Local jurisdictions have authority to acquire land or collect in-lieu fees to avoid a reduction in park acreage per capita.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, regional growth is forecasted to result in an increase of 161,338 people (4.8 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). As noted under Threshold PS-1, approximately 78.8 percent of the 2025 population growth would occur within the City of San Diego, City of Chula Vista, and City of Escondido. In each of the communities where growth would occur, park and recreation facilities would experience an increase in their use, which would accelerate the deterioration of the existing facilities. In addition, approximately 663 acres of open space parks and 251 acres of recreation lands across various locations throughout the region would be removed by development as a result of regional growth and land use change between 2016 and 2025. Figure 4.15-2 illustrates where these conversions would occur. Specifically, the majority of the open space conversions would occur as a result of growth and land use change in eastern Otay Mesa near the International Border, as shown in Figure 4.15-2, which would convert 521 acres of open space parks to non-open space uses by 2025. Park and recreational facility expansions would offset these impacts; however, communities throughout the region may not be able to keep up with the demand for park and recreational facilities proportionate to the projected increase in population demand. Compliance with the Quimby Act would require developers set aside land, donate conservation easements, or pay fees for park improvements, which would partially offset the projected impacts. However, there is no assurance that future park and recreation facilities would be capable of adequately serving forecasted populations, and a physical deterioration of park and recreation facilities may occur or be accelerated by 2025. Therefore, this is a significant impact.

Transportation Network Improvements and Programs

Most network improvements from 2016 to 2025 are additions to existing highways, rail corridors, or local roads located in established communities, such as the addition of managed lanes along I-5 through the coastal cities of Encinitas, Carlsbad, and Oceanside; and the addition of new toll lanes on SR 11 to the Otay Mesa East Port of Entry (POE). The proposed Plan also includes the construction of new facilities by 2025, such as the final segment of SR 11, the future toll road, and the SR 125/SR 11/SR 905 southbound connector ramps as part of the SR 11/Otay Mesa East POE. Other planned network improvements include active transportation projects and improvements to regional arterials, which occur along or within existing transportation alignments. Major improvements also include double-tracking at certain locations on the LOSSAN Rail Corridor and station addition in the Gaslamp Quarter in downtown San Diego. The proposed Plan also includes new infrastructure as part of the Mobility Hubs consisting of parking, electric vehicle charging stations, travel kiosks, passenger loading zones, parcel delivery lockers and carshare parking.

Transportation network improvements would not result in substantial physical deterioration of recreational facilities (i.e., parkland, open space, and recreation uses) through indirect impacts such as noise or increased

surface runoff in 2025 due to compliance with design standards. However, the future transportation network improvements, including new and facility widenings, would directly displace ~~54~~ 59 acres of open space parks and ~~20~~ 21 acres of recreation lands (Figure 4.15-2). In addition, the future transportation network improvements could have impacts on the following County parks and recreation facilities through the year 2050: Eastview County Park and Sweetwater Regional Park (i.e., SR 125 Complete Corridor improvements from SR 905 to SR 54), Lakeside Sports Park (San Diego River Trail from Mast Park to Lakeside baseball park), Los Peñasquitos Canyon Preserve (Commuter Rail) , Otay Valley Regional Park (Heritage Road Bridge), San Elijo Lagoon and Ecological Reserve (North Coast Bike Trail), San Luis Rey River Park (San Luis Rey River Trail), and Waterfront Park (Commuter Rail). None of the County trails would be impacted by transportation network improvements. Furthermore, ~~T~~the transportation network improvements and programs, in particular rail improvements and active transportation facilities, could redistribute a portion of existing travel and attract transit users to recreation facilities in the vicinity of transit stops and stations leading to minor increases in usage. Construction of the transportation network improvements, such as facility widenings, may also require the temporary closure or re-routing of bicycle facilities. All bike lane or path closures would be properly noticed and safely detoured. In addition, active transportation improvements would expand recreation opportunities, such as bicycle facilities, in the region resulting in adverse physical impacts. Therefore, transportation network improvements would not lead to a substantial increase in the use of existing recreational facilities but would expand active transportation facilities and remove land designated for park and recreation uses and increase park and recreational usage near expanded transit. The proposed Plan would put more pressure on existing facilities and contributing to their physical deterioration given there would be no assurance that future park and recreation facilities would expand to offset the acreage removals. Therefore, this is a significant impact.

2025 Conclusion

Implementation of regional growth and land use changes would result in increased demand for recreation facilities leading to accelerated deterioration while regional growth and transportation network improvements combined would contribute to the expansion of active recreation facilities and the physical removal of ~~988~~ 994 acres of open space park and recreation lands by the year 2025. Collectively, these impacts would result in the substantial physical deterioration of existing park and recreation facilities and adverse physical impacts related to future facility expansions. Therefore, this impact (REC-1) in the year 2025 is significant.

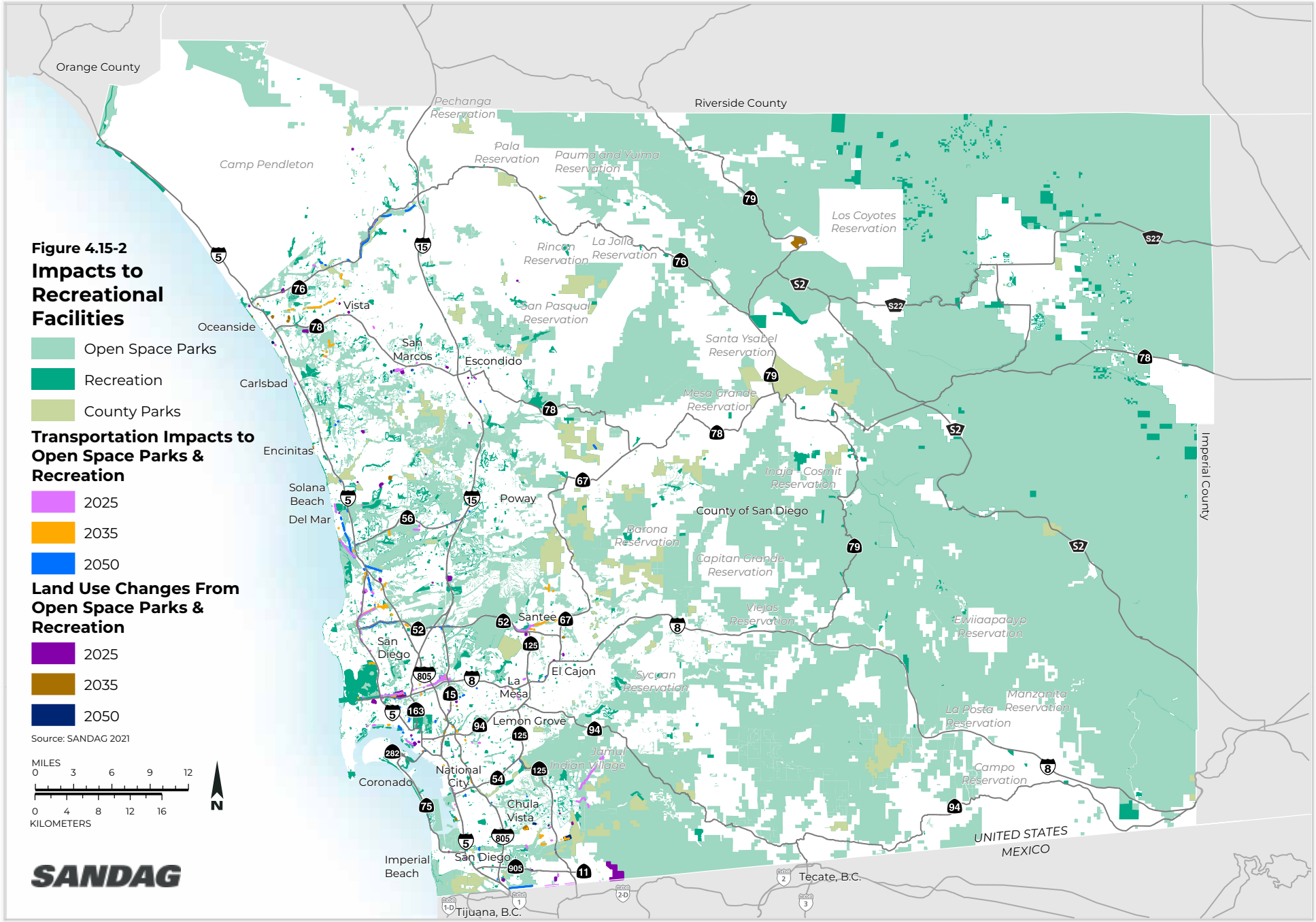


Figure 4.15-2
Impacts to Recreational Facilities
Open Space Parks
Recreation
County Parks
Transportation Impacts to Open Space Parks & Recreation
2025
2035
2050
Land Use Changes From Open Space Parks & Recreation
2025
2035
2050
Source: SANDAG 2021
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional growth is forecasted to result in an increase of 149,500 people (4.3 percent), 121,650 housing units (9.4 percent), and 159,728 jobs (9 percent). As noted under PS-1, approximately 78 percent of the 2035 population growth would occur in the City of San Diego and City of National City. In each of the communities where growth would occur, park and recreation facilities would experience an increase in their use, which would accelerate the deterioration of the existing facilities. In addition, approximately 45 additional acres of open space parks and 324 additional acres of recreation lands would be displaced by development in various locations throughout the region as a result of 2035 regional growth and land use change (Figure 4.15-2). Between 2026 and 2035, the majority of the open space conversions would be occur as a result of growth and land use change in the Warner Springs area shown in Figure 4.15-2, which would convert 275 acres of open space parks to spaced rural residential use. When combined with the conversion of 663 acres of open space parks and 251 acres of recreation lands by 2025, a total removal of ~~678~~ 708 acres of open space parks and 575 acres of recreation lands would be expected by 2035 under the proposed Plan. Similar to 2025, park and recreation facility expansions would offset these impacts; however, communities throughout the region may not be able to keep up with the demand for park and recreational facilities proportionate to the projected increase in population demand. Compliance with the Quimby Act would require developers set aside land, donate conservation easements, or pay fees for park improvements, which would partially offset the projected impacts. However, there is no assurance that future park and recreation facilities would be capable of adequately serving forecasted populations, and a physical deterioration of park and recreation facilities may occur or be accelerated by 2035. Therefore, this is a significant impact.

Transportation Network Improvements and Programs

By 2035, additional transportation network improvements and programs are proposed in areas throughout the region. Most transportation improvements would affect existing transportation facilities, such as SPRINTER rail corridor double-tracking; Blue, Orange, and Green Trolley line double/third tracking; rail grade separations; additional managed lanes and general purpose lanes along existing freeways and highways; improvements to regional arterials; and active transportation projects. Other planned transportation network improvements, including the Commuter Rails 398 and 582 extensions, would require acquisition of new rights-of-way in highly developed established communities.

As is true in the 2025 analysis, none of the proposed 2035 transportation network improvements and programs would create new demand for park and recreation facilities beyond the level of demand created by new regional growth, except where expanded transit would result in a minor redistribution of trips and increases in recreational usage near transit stations or stops. Similar to 2025 improvements, construction of the 2035 transportation network improvements, such as facility widenings, may also require the temporary closure or re-routing of bicycle facilities. All bike lane or path closures would be properly noticed and safely detoured. Ultimately, active transportation improvements implemented by 2035 would expand recreation opportunities, such as bicycle facilities, in the region resulting in adverse physical impacts. The future transportation network improvements implemented between 2026 and 2035 would directly remove ~~46~~ 53 acres of open space parks and ~~9~~ 16 acres of recreation lands (Figure 4.15-2) and, when added to the removal impacts occurring by 2025, would result in a total displacement of ~~100~~ 112 acres of open space parks and ~~29~~ 37 acres of recreation lands by 2035 under the proposed Plan. Therefore, transportation network improvements would not lead to a substantial increased demand on existing recreational facilities but would expand active transportation facilities and remove an additional ~~55~~ 69 acres of land designated for such uses, putting more pressure on

existing facilities and contributing to their physical deterioration given there would be no assurance that future park and recreation facilities would expand to offset the acreage removals. Therefore, this is a significant impact.

2035 Conclusion

Implementation of regional growth and land use changes by 2035, would result in increased demand for recreation facilities leading to accelerated deterioration, while regional growth and transportation network improvements combined would contribute to the expansion of active recreation facilities and the physical removal of an additional ~~424~~ 438 acres of open space park and recreation lands leading to a total removal of ~~1,512~~1,412 acres by 2035. Collectively, these impacts would result in the substantial physical deterioration of existing park and recreation facilities and adverse physical impacts related to future facility expansions. Therefore, this impact (REC-1) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, regional growth is forecasted to result in an increase of 125,725 people (3.4 percent), 61,433 housing units (4.3 percent), and 164,843 jobs (8.5 percent). As noted under Threshold PS-1, approximately 78 percent of the 2050 population growth would occur in the City of San Diego, City of Chula Vista, and City of San Marcos. In each of the communities where growth would occur, park and recreation facilities would experience an increase in their use, which would accelerate the deterioration of the existing facilities. In addition, approximately 77 additional acres of open space parks and 6 additional acres of recreation lands would be directly removed by development in various locations throughout the region as a result of regional growth and land use change between 2036 and 2050 (Figure 4.15-2). When combined with the conversion of open space parks and recreation lands by 2035, a total removal of ~~755~~ 785 acres of open space parks and 581 acres of recreation lands would be expected by 2035 under the proposed Plan. Recreation facility expansions would offset these impacts; however, communities throughout the region may not be able to keep up with the demand for park and recreational facilities proportionate to the projected increase in population demand. Compliance with the Quimby Act would require developers set aside land, donate conservation easements, or pay fees for park improvements, which would partially offset the projected impacts. However, there is no assurance that future park and recreation facilities would be capable of adequately serving forecasted populations, and a physical deterioration of park and recreation facilities may occur or be accelerated by 2050. Therefore, this is a significant impact.

Transportation Network Improvements and Programs

Between 2036 and 2050, additional transportation network improvements and programs are proposed in areas throughout the region. Most of the transportation network improvements would affect existing transportation facilities, such as Blue, Orange, and Green Trolley line double/third tracking; rail grade separations; additional managed lanes and general purpose lanes along existing freeways and highways; improvements to regional arterials; and active transportation projects. Other planned transportation network improvements including Commuter Rail 581, 582, 583, and 398 extensions and the SPRINTER extension would require acquisition of new rights-of-way.

However, as is true in the 2025 and 2035 analyses, none of the proposed 2050 transportation network improvements and programs would create new demand for park and recreation facilities beyond the level of

demand created by new regional growth, with the exception of the minor redistribution of trips that may lead to increased usage of recreation facilities near transit stations and stops. Construction of the transportation network improvements, such as facility widenings, may also require the temporary closure or re-routing of bicycle facilities. All bike lane or path closures would be properly noticed and safely detoured. In addition, active transportation improvements would expand recreation opportunities, such as bicycle facilities, in the region resulting in adverse physical impacts. However, the future transportation network improvements would displace ~~64~~ 89 additional acres of open space parks and ~~9~~ 13 additional acres of recreation lands, which when added to the removal impacts occurring by 2035 result in a total removal of ~~164~~ 201 acres of open space parks and ~~38~~ 50 acres of recreation lands by 2050 (Figure 4.15-2). Therefore, transportation network improvements would not lead to the increased use of recreational facilities but would result in the construction of new active transportation facilities and would remove ~~73~~ 76 additional acres of land designated for such uses, putting more pressure on existing facilities and contributing to their physical deterioration given there would be no assurance that future park and recreation facilities would expand to offset the acreage removals. Therefore, this is a significant impact by 2050.

2050 Conclusion

Implementation of regional growth and land use changes by 2050 would result in increased demand for recreation facilities leading to accelerated deterioration, while regional growth and transportation network improvements combined would contribute to the expansion of active recreation facilities and the physical removal of an additional ~~424~~ 186 acres of open space park and recreation lands leading to a total removal of ~~1,585~~ 1,598 acres by 2050 under the proposed Plan. Collectively, these impacts would result in the substantial physical deterioration of existing park and recreation facilities and adverse physical impacts related to future facility expansions. Therefore, this impact (REC-1) in the year 2050 would be significant.

Exacerbation of Climate Change Effects

It is uncertain whether the proposed Plan may exacerbate climate change effects on increased use and deterioration of recreation facilities. Increased risk of some hazards, such as extreme heat, may cause more people to visit recreation centers as cooling centers to use swimming pools, or parks to escape the heat (Kalansky et al. 2018). On the other hand, increased risk of other hazards, such as wildfires and flooding, may decrease attendance at recreation centers as going outdoors becomes more dangerous. Thus, it is difficult to draw a conclusion on the proposed Plan's potential exacerbation of climate change effects on increased use of recreation facilities. However, climate change risks from extreme heat, wildfire, extreme precipitation and flooding, and sea-level rise and storm surge could cause physical deterioration of any exposed recreation facilities.

MITIGATION MEASURES

REC-1 INCREASE THE USE OF EXISTING NEIGHBORHOOD AND REGIONAL PARKS OR OTHER RECREATIONAL FACILITIES SUCH THAT SUBSTANTIAL PHYSICAL DETERIORATION OF THE FACILITY WOULD OCCUR OR BE ACCELERATED

2025, 2035, and 2050

REC-1 Implement Mitigation Measures for Parks and other Recreational Facilities. During planning, design, and project-level CEQA review of development projects and transportation network improvements and programs, the County of San Diego, cities, and other public service providers can and should, SANDAG shall,

and other transportation project sponsors can and should implement mitigation measures to avoid or reduce substantial physical deterioration of parks or other recreational facilities. Mitigation measures could include expanding or improving existing recreation facilities to accommodate additional use, or building new recreation facilities.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of mitigation measure REC-1 would reduce impacts related to the adverse physical impacts of facility expansions and deterioration of existing parkland and recreational facilities in 2025, 2035, and 2050, but not to a less-than-significant level. Local jurisdictions with inadequate parkland per capita would use State regulations and local plans and ordinances to acquire land and funding for the provision of new parkland as population growth occurs. However, it cannot be assured that adequate financial resources would be available to acquire the amount of parkland needed to meet forecasted population growth and offset losses that would occur a result of transportation improvements. Therefore, this impact (REC-1) would remain significant and unavoidable.

U-1 RESULT IN THE EXPANSION, RELOCATION, OR CONSTRUCTION OF WASTEWATER COLLECTION AND TREATMENT, STORMWATER DRAINAGE, ELECTRIC POWER, NATURAL GAS, OR TELECOMMUNICATIONS FACILITIES TO ADEQUATELY MEET PROJECTED CAPACITY NEEDS, THE CONSTRUCTION OF WHICH COULD CAUSE SIGNIFICANT ENVIRONMENTAL IMPACTS

ANALYSIS METHODOLOGY

This section analyzes impacts associated with the provision of or need for new or physically altered utilities facilities in order to maintain adequate services under the proposed Plan (aside from water supply facilities, which are evaluated separately in Section 4.18). A significant impact would occur if forecasted regional growth and land use change or planned transportation network improvements and programs required construction, expansion, or relocation of utilities facilities that would result in adverse physical impacts.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, regional growth is forecasted to result in an increase of 161,338 people (4.8 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). The 2025 regional land use pattern is shown in Figure 2-17 Approximately 78.8 percent of the 2025 population growth would occur within the City of San Diego (57.9 percent), City of Chula Vista (12.1 percent), and City of Escondido (8.8 percent). Collectively, these three jurisdictions would accommodate approximately 78 percent of new housing units and 63 percent of new jobs, respectively, by 2025. In these cities, higher demand for new utility infrastructure, upgraded systems, and/or expansions would occur, while demand for utilities would also increase throughout the region in response to forecasted growth. In general, however, regional growth and land use change in urban areas would have less demands on utilities than in more rural areas that are not currently served by utility infrastructure.

While population growth would result in an increase in the amount of wastewater generated, especially in the cities of San Diego, Chula Vista, and Escondido, the service providers responsible for operating the existing wastewater treatment plants outlined in Table 4.15-7 would have to maintain sufficient conveyance and treatment capacity to serve forecasted growth through 2025 in accordance with approved Wastewater Discharge Requirements filed with the SWRCB and local health ordinances. Development in existing communities would require expansion or upsizing of existing collection and treatment systems, while development in new areas would require installation of new collection and treatment systems. Development in rural residential areas would also require onsite wastewater treatment facilities, such as septic tanks.

Similarly, stormwater drainage improvements would need to be constructed to serve new development and redeveloped areas to accommodate forecasted growth through 2025. Increases in impervious surfaces would increase stormwater runoff, which would increase the volume and/or velocity of stormwater flows leading to flooding, scouring, erosion, and other drainage pattern alterations. Therefore, regional growth and land use change that results from implementation of the proposed Plan in 2025 would require the construction of new or expanded stormwater drainage facilities to ensure adequate capacity for the conveyance of stormwater. Development associated with the proposed Plan would have to comply with all existing regulations pertaining to drainage patterns (i.e., the local Standard Urban Stormwater Mitigation Plan [SUSMP] and Hydromodification Management Plan [HMP]). The stormwater regulations include the requirement that post-project stormwater flows match the pre-project flows for PDPs. When there is an increase in impervious area, this requirement would generally be achieved through the implementation of the appropriate BMPs described in the local SUSMP and HMP, and the County Low Impact Development (LID) Handbook. LID is an integrated site design methodology that uses small-scale detention and retention to minimize pollutants conveyed by runoff and to mimic pre-project site hydrological conditions. Furthermore, drainage systems would be upgraded and increased in size in areas determined by each MS4 operator to have inadequate conveyance capacity relative to new impervious surface to reduce impacts related to stormwater runoff through their SUSMP and/or JURMP. Hydrologic impacts resulting from construction would be primarily addressed through compliance with the Construction General Permit as discussed in Section 4.10.

Regional growth and land use change would increase demand for energy resources and require electricity and/or natural gas infrastructure relocations and/or improvements to serve development through 2025. As described in Section 4.6, *Energy*, projected growth would trigger the need for new or expanded energy facilities, including power plants, distributed generation, electrical transmission and distribution infrastructure, and natural gas facilities (e.g., storage, pipelines). Construction and operation of the facilities would have a range of impacts depending on the facility type, size, and location. Forecasted regional growth and land use change would primarily occur in or adjacent to areas that are already developed and that have electricity and natural gas infrastructure in place. Although this would reduce the need for construction of new facilities in other areas, the increases in demand for electricity and natural gas would result in upgrades of transmission lines, substations, and distribution and related facilities that already serve these areas to ensure that energy infrastructure adequately meets future needs. Telecommunications systems would also need to be constructed to serve new development and redeveloped areas associated with forecasted population growth and land use change through 2025. Demand for telecommunication infrastructure would require the construction of broadband cable lines, telephone lines, cellular towers, and other transmission devices. Similar to other utility infrastructure, development in existing communities would require expansion or upsizing of existing systems, while development in new areas would require installation of new systems.

The provision of new or expanded wastewater treatment facilities and collection systems, stormwater conveyance and treatment BMPs, new or expanded energy facilities, and telecommunications infrastructure would result in short-term construction-related impacts and long-term operational impacts on such resources

as air quality, noise, traffic, and water quality, among others. WDRs and existing regulations, as further described in Section 4.10, would reduce water quality impacts of future utility construction projects. Construction-related and long-term operational impacts are typically controllable and avoided or substantially reduced by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs, such as those issued and enforced through the SWRCB and RWQCB. Because details are not known about timing, location, and other project-specific information for provision of new or expanded utility systems, it cannot be guaranteed that impacts from the construction and operation of new or expanded facilities and collection systems would be less than significant for all projects. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

While most of the transportation improvements (e.g., highway, arterial, transit, and active transportation) would occur in already urbanized areas, some improvements would require new connections and expansions of utility infrastructure and convert vacant land to impervious surfaces, resulting in increased stormwater flow volume and/or velocity. As described in Section 4.10.2, engineering standards, including the Caltrans Highway Design Manual and County requirements, exist for properly controlling and conveying surface runoff and surface waters when drainage modifications are necessary for project implementation. In addition, requirements in the Municipal Stormwater Permit (Order R9-2013-0001) require that PDPs maintain pre-project hydrology under post-construction operation. This means that additional runoff volumes and peak flow discharges from new impervious areas must be attenuated to pre-project levels in order to maintain hydrological conditions and not exceed stormwater conveyance capacities. One of the methods for achieving this is through the implementation of LID.

However, new or expanded stormwater drainage facilities would be required to support the transportation network improvements by the year 2025, and any increase in the volume of stormwater generated would require stormwater drainage facilities with sufficient capacity downstream in channels and other drainage outlets. Additionally, changes to drainage patterns due to transportation improvements, as further discussed under Impact HWQ-2 in Section 4.10, would necessitate the construction of stormwater drainage facilities in new places.

A number of the transportation network improvements would require relocated or new electrical or natural gas infrastructure, such as the supporting infrastructure to the mobility hubs (i.e., traction power substations to provide power to the automated people movers), fleet electrification plans (i.e., Neighborhood Electric Vehicles), and various transit station improvements, such as communications equipment, signalizing systems and security lighting. The proposed Plan would also increase the number of electric vehicles and charging stations throughout the region and within mobility hubs. Construction impacts associated with the installation of electricity and natural gas connections or the relocation of existing lines are expected to be confined to trenching within rights-of-way in order to place the lines below surface. Electrical and natural gas facilities required for the planned transportation network improvements would be constructed as part of the various network improvements. Because the demand for electrical energy and natural gas associated with the transportation network improvements in the proposed Plan would be a small fraction of the regional use new energy facilities would not be necessary beyond the infrastructure needs associated with regional growth and land use change.

Similar to regional growth and land use change, the provision of new or expanded utility infrastructure in conjunction with the transportation network improvements in the proposed Plan in 2025 would result in short-term construction-related impacts and long-term operational impacts on such resource areas as

biological resources and water quality. These impacts would be anticipated as a result of stormwater and drainage infrastructure and energy infrastructure upgrades and relocations associated with transportation network improvements changes. It is not anticipated that wastewater conveyance and treatment or telecommunication systems would need to be installed or expanded to serve the 2025 transportation network. Construction-related and long-term operational impacts are typically controllable and avoided or substantially reduced by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs. Because details are not known about timing, location, and other project-specific information for provision of new or expanded utility systems, it cannot be guaranteed that impacts from the construction and operation of such facilities would be less than significant for all projects. Therefore, transportation network improvements would cause a less-than-significant impact on wastewater, electrical, natural gas, and telecommunications infrastructure and a significant impact related to stormwater drainage facilities.

2025 Conclusion

Implementation of regional growth and land use change, as well as transportation network improvements and programs, would result in substantial adverse physical impacts associated with the construction and operation of new or expanded utility infrastructure for wastewater, storm drain, electrical, natural gas and telecommunications systems. Therefore, the impact (U-1) in the year 2025 would be significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional growth is forecasted to result in an increase of 149,500 people (4.3 percent), 121,650 housing units (9.4 percent), and 159,728 jobs (9 percent). Approximately 78 percent of the 2035 population growth would occur in the City of San Diego (70.9 percent) and City of National City (7.3 percent). These two jurisdictions would account for approximately 73 percent of new housing units and 60 percent of new jobs, respectively, by 2035. In these cities, higher demand for new utility infrastructure, upgraded systems and/or expansions would occur, while demand for utilities would also increase throughout the region in response to forecasted growth. In general, however, regional growth and land use change in urban areas would have less demand on utilities than in more rural areas that are not currently served by utility infrastructure.

Similar to 2025, 2035 forecasted growth in accordance with the proposed Plan would trigger the need for the provision of new or expanded wastewater treatment facilities and collection systems, stormwater conveyance and treatment BMPs, electrical and natural gas facilities, and telecommunications infrastructure, which would result in short-term construction-related impacts and long-term operational impacts on such resources as air quality, noise, traffic, and water quality, among others. WDRs and existing regulations, as further described in Section 4.10, would reduce water quality impacts of future utility construction projects. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessen by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs, such as those issued and enforced through the SWRCB and RWQCB. Because details are not known about timing, location, and other project-specific information for provision of new, relocated, or expanded utility systems, it cannot be guaranteed that impacts from the construction and operation of new or expanded facilities and collection systems would be less than significant for all projects. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

Similar to 2025, the provision of new, relocated or expanded utility infrastructure in conjunction with the transportation network improvements in the proposed Plan in 2035 would result in short-term construction-related impacts and long-term operational impacts on such resource areas as biological resources, cultural resources, and water quality, among others. These impacts would be anticipated as a result of stormwater and drainage infrastructure put in place as part of the transportation network improvements. It is not anticipated that wastewater conveyance and treatment or telecommunication systems would need to be installed or expanded to serve the 2035 transportation network. A number of the transportation network improvements would require relocated or new electrical or natural gas infrastructure, particularly at mobility hubs such as the Central Mobility Hub and San Ysidro Mobility Hub, as discussed in more detail above under 2025. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessen by mitigation measures adopted by the implementing agency, including adherence to existing regulations and installation of BMPs. Because details are not known about timing, location, and other project-specific information for provision of new, relocated or expanded utility systems, it cannot be guaranteed that impacts from the construction and operation of such facilities would be less than significant for all projects. Therefore, transportation network improvements and programs would cause a less-than-significant impact on the demand for wastewater, electrical, natural gas, and telecommunications infrastructure and a significant impact related to stormwater drainage facilities.

2035 Conclusion

Implementation of regional growth and land use change would result in substantial adverse physical impacts associated with the construction and operation of new, relocated or expanded utility infrastructure for wastewater, storm drain, electrical, natural gas and telecommunications systems. Transportation network improvements and programs would cause a less-than-significant impact on wastewater, electrical, natural gas, and telecommunications infrastructure and a significant impact related to stormwater drainage facilities. Therefore, the impact (U-1) by the year 2035 would be significant.

2050

Regional Growth and Land Use Change

From 2036 to 2050, regional growth is forecasted to result in an increase of 125,725 people (3.4 percent), 61,433 housing units (4.3 percent), and 164,843 jobs (8.5 percent). Approximately 78 percent of the 2050 population growth would occur in the City of San Diego, City of Chula Vista, and City of San Marcos. In these cities, higher demand for new utility infrastructure, upgraded systems, and/or expansions would occur, while demand for utilities would also increase throughout the region in response to forecasted growth. In general, however, regional growth and land use change in urban areas would have less demand on utilities than in more rural areas that are not currently served by utility infrastructure.

Similar to 2025 and 2035, 2050 forecasted growth in accordance with the proposed Plan would trigger the need for the provision of new or expanded wastewater treatment facilities and collection systems, stormwater conveyance and treatment BMPs, energy (i.e., electrical and natural gas) facilities, and telecommunications infrastructure, which would result in short-term construction-related impacts and long-term operational impacts on such resource areas as air quality, noise, traffic, and water quality, among others. WDRs and existing regulations, as further described in Section 4.10, would reduce water quality impacts of future utility construction projects. Construction-related and long-term operational impacts are typically controllable and

avoided or substantially reduced by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs, such as those issued and enforced through the SWRCB and RWQCB. Because details are not known about timing, location, and other project-specific information for provision of new or expanded utility systems, it cannot be guaranteed that impacts from the construction and operation of new or expanded facilities and collection systems would be less than significant for all projects. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

The provision of new or expanded utility infrastructure, in particular stormwater drainage associated with the transportation network improvements in the proposed Plan in 2050 would result in short-term construction-related impacts and long-term operational impacts on such resource areas as biological resources, cultural resources, and water quality, among others. These impacts would be anticipated as a result of stormwater and drainage infrastructure put in place as part of the transportation network improvements. It is not anticipated that wastewater conveyance and treatment or telecommunication systems would need to be installed or expanded to serve the 2050 transportation network. As with 2025 and 2035, construction-related and long-term operational impacts are typically controllable and avoided or substantially reduced by mitigation measures adopted by the implementing agency, including adherence to existing regulations and installation of BMPs. Because details are not known about timing, location, and other project-specific information for provision of new or expanded utility systems, it cannot be guaranteed that impacts from the construction and operation of such facilities would be less than significant for all projects. Therefore, transportation network improvements and programs would cause a less-than-significant impact on wastewater, electricity, natural gas, and telecommunications infrastructure and a significant impact related to stormwater drainage facilities.

2050 Conclusion

Implementation of regional growth and land use change by 2050, would result in substantial adverse physical impacts associated with the construction and operation of new or expanded utility infrastructure for wastewater, storm drain, and telecommunications systems. Transportation network improvements and programs would cause a less-than-significant impact on wastewater, electricity, natural gas, and telecommunications infrastructure and a significant impact related to stormwater drainage facilities. Therefore, the impact (U-1) by the year 2050 would be significant.

Exacerbation of Climate Change Effects

The proposed Plan could potentially exacerbate climate change effects on the need for new or expanded utility infrastructure, particularly storm drain infrastructure. Climate change is expected to increase the risk of flooding due to more frequent and intense extreme precipitation events, which may strain current capacity of stormwater infrastructure and thus eventually spur growth for new infrastructure to capture excess stormwater (County of San Diego 2018c, Ascent Environmental Inc. 2017, Tuler 2016). The proposed Plan is also expected to result in substantial adverse physical impacts to existing utility infrastructure that may necessitate construction of new or expanded infrastructure; this could contribute to impacts on existing infrastructure the region is already expected to see under climate change. However, it is uncertain to what degree climate change could spur growth for new stormwater infrastructure, because it depends on decision-making surrounding implementation of climate adaptation measures; lead agencies may not decide to construct additional stormwater infrastructure in reaction to increased flooding risks.

MITIGATION MEASURES

U-1 RESULT IN THE EXPANSION, RELOCATION, OR CONSTRUCTION OF WASTEWATER COLLECTION AND TREATMENT, STORMWATER DRAINAGE, ELECTRIC POWER, NATURAL GAS, OR TELECOMMUNICATIONS FACILITIES TO ADEQUATELY MEET PROJECTED CAPACITY NEEDS, THE CONSTRUCTION OF WHICH COULD CAUSE SIGNIFICANT ENVIRONMENTAL IMPACTS

2025, 2035, and 2050

U-1a Implement Mitigation Measures for New/Expanded Wastewater, Stormwater, Electrical, Natural Gas, and Telecommunications Facilities Associated with Development Projects. During planning, design, and project-level CEQA review of development projects, the County of San Diego, cities, and other wastewater, stormwater, and telecommunications management agencies can and should apply necessary mitigation measures to avoid or reduce significant environmental impacts associated with the construction or expansion of new or expanded facilities. Mitigation measures should be implemented by utilities management agencies directly responsible for the approval and construction of new or expanded facilities. Significant environmental impacts requiring mitigation may include, but are not limited to, air quality, biological resources, cultural resources, energy, greenhouse gas emissions, hydrology and water quality, noise, paleontological resources, traffic, tribal cultural resources, and water supply. Mitigation measures may be similar to those described in this EIR for construction of development projects.

U-1b Implement Mitigation Measures for New/Expanded Stormwater Facilities Associated with Transportation Network Improvements. During planning, design, and project-level CEQA review of transportation network improvements, SANDAG shall, and other transportation project sponsors can and should, be required to implement stormwater BMPs during planning, design, project-level CEQA review, and project construction. Measures include, but are not limited to, implementation and construction of sand filters, bio strips, bioswales, detention basins, storage vaults, and infiltration basins, which would reduce pollutant runoff into the storm drain system.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of the proposed Plan would result in significant impacts associated with the construction or expansion of utility systems and facilities in 2020, 2035, and 2050 in order to serve areas undergoing population growth and transportation network improvements. Mitigation measures U-1a and U-1b would reduce the impacts of project-specific construction or expansion through project-level planning, design, and CEQA mitigation measures. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, the impact (U-1) would remain significant and unavoidable.

U-2 GENERATE SOLID WASTE IN EXCESS OF STATE OR LOCAL STANDARDS OR IN EXCESS OF THE CAPACITY OF LOCAL INFRASTRUCTURE; NEGATIVELY IMPACT THE PROVISION OF SOLID WASTE SERVICES; IMPAIR THE ATTAINMENT OF SOLID WASTE REDUCTION GOALS; OR FAIL TO COMPLY WITH FEDERAL, STATE, AND LOCAL MANAGEMENT AND REDUCTION STATUTES AND REGULATIONS RELATED TO SOLID WASTE

ANALYSIS METHODOLOGY

This section analyzes impacts from the generation of solid waste associated with implementation of the proposed Plan that would exceed the capacity of local infrastructure and services or fail to comply with statutes and regulations related to solid waste. A significant impact would occur if forecasted regional growth and land use change or planned transportation network improvements and programs either result in generation of solid waste that exceeded the capacity of landfills or caused a failure to comply with federal, State, or local goals or standards, which include demonstrating at least 15 years of remaining disposal capacity in landfills and diverting an increasing percentage of waste streams over time. To evaluate potential impacts, expected increases in solid waste generation are compared to available permitted landfill capacity and applicable standards, waste reduction goals, and management statutes.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Regional growth forecasted to occur between 2016 and 2025 would produce both C&D debris and municipal solid waste during operations. It is anticipated that the majority of construction-phase C&D debris would likely be diverted, while lower diversion rates are expected during operation of new developments. Existing programs, policies, and practices in place throughout the region would continue to reduce the rate of solid waste generation (amount per person or per employee) and divert a percentage of solid waste from landfills to recycling facilities. As explained in Section 4.15.1, as of 2016 the Miramar Landfill has 11 percent capacity remaining and is estimated to close in 2030, which would significantly reduce the available capacity at landfills in the region. The Borrego Landfill, Otay Landfill, and Sycamore Landfill have remaining capacity and are estimated to close by the years 2046, 2030, and 2042, respectively (CalRecycle 2021c). As noted in Table 4.15-11, the County and City can demonstrate they have more than 15 years of permitted landfill capacity at these facilities as required by the State's Integrated Waste Management Act. Therefore, there would be sufficient landfill capacity in the region to accommodate forecasted regional growth through 2025. As a result, given waste management programs and reduction measures in place throughout the region focused on diverting an increasing percentage of waste from landfills, forecasted regional growth would not generate solid waste at a level that would exceed the capacity of permitted solid waste disposal facilities in the region. Regional growth and land use change would have a less-than-significant impact.

Transportation Network Improvements and Programs

Construction of transportation network improvements that would be implemented by the year 2025 would generate solid waste and C&D debris. While some of these materials would be processed separately, some waste from these construction projects would end up in municipal solid waste facilities. The need to dispose of solid waste as part of the transportation network improvements would contribute to reduced capacity of landfills in the region. As discussed in the regional growth and land use change analysis, there is sufficient landfill capacity to accommodate forecasted growth in the region at least through 2025, and there are programs in place to increase the amount of waste diversion. Therefore, transportation network improvements would not generate solid waste at a level that would require new or expanded solid waste disposal facilities given waste management programs and reduction measures in place within the region. Transportation network improvements and programs would have a less-than-significant impact.

2025 Conclusion

Implementation of regional growth and land use change, as well as transportation network improvements and programs, would not result in substantial adverse physical impacts associated with the construction of new or expanded solid waste facilities. Therefore, this impact in the year 2025 would be less-than-significant.

2035

Regional Growth and Land Use Change

Regional growth forecasted to occur between 2026 and 2035 would produce both C&D debris and municipal solid waste during operations. It is anticipated that the majority of construction-phase C&D debris would likely be diverted, while lower diversion rates are expected during operation of new developments. Existing programs, policies, and practices in place throughout the region would continue to reduce the rate of solid waste generation (amount per person or per employee) and divert a percentage of solid waste from landfills to recycling facilities. By 2035, Borrego Landfill and Sycamore Landfill would be the only permitted landfills with remaining disposal capacity as they are estimated to close by the years 2046 and 2042, respectively (CalRecycle 2021c). With the projected closure of the Miramar Landfill and Otay Landfill before 2035, the County and City could still demonstrate it has more than 15 years of permitted landfill capacity at the other facilities as required by the State's Integrated Waste Management Act. However, there may not be sufficient landfill capacity in the region to accommodate forecasted regional growth through 2035. As a result, given waste management programs and reduction measures in place throughout the region focused on diverting an increasing percentage of waste from landfills, forecasted regional growth would generate solid waste at a level that would exceed the capacity of permitted solid waste disposal facilities in the region even with waste reduction measures in place. Regional growth and land use change would have a significant impact.

Transportation Network Improvements and Programs

Construction of transportation network improvements that would be implemented by the year 2035 would primarily generate C&D debris and a minimal amount of municipal solid waste (i.e., associated with construction workforce and Mobility Hub and transit station operations) While much of the C&D debris materials would be processed and diverted from landfills in accordance with recycling programs and policies, small quantities of municipal solid waste produced from these construction projects would end up in landfills. The need to dispose of waste as part of the transportation network improvements would contribute to reduced capacity of landfills in the region, which may not be sufficient to accommodate the regions waste disposal needs by 2035. Therefore, transportation network improvements would generate solid waste at a level that would exceed the capacity of permitted solid waste disposal facilities in the region and would require new or expanded solid waste disposal facilities. Transportation network improvements and programs would have a significant impact.

2035 Conclusion

Implementation of regional growth and land use change and transportation network improvements and programs in the proposed Plan by 2035 would generate solid waste and C&D debris that may not be accommodated by the regional landfills. Although, the forecasted growth and network improvements would comply with programs, policies, and practices to reduce the rate of solid waste generation, this impact (U-2) in the year 2035 would be significant.

2050

Regional Growth and Land Use Change

Regional growth forecasted to occur between 2036 and 2050 would produce both C&D debris and municipal solid waste during operations. It is anticipated that the majority of construction-phase C&D debris would likely be diverted, while lower diversion rates are expected during operation of new developments. Existing programs, policies, and practices in place throughout the region would continue to reduce the rate of solid waste generation (amount per person or per employee) and divert a percentage of solid waste from landfills to recycling facilities. However, all of the currently permitted landfills would be closed before 2050, and the County and City would have to expand the permitted capacity within their jurisdictions to demonstrate they have more than 15 years of permitted landfill capacity as required by the State's Integrated Waste Management Act. Because there may not be sufficient landfill capacity in the region to accommodate forecasted regional growth through 2050, forecasted regional growth would generate solid waste at a level that would exceed the capacity of permitted solid waste disposal facilities in the region even with waste reduction measures in place. Regional growth and land use change would have a significant impact.

Transportation Network Improvements and Programs

Construction of transportation network improvements that would be implemented by the year 2050 would primarily generate C&D debris and a minimal amount of municipal solid waste (i.e., associated with construction workforce and mobility hub and transit station operations) While much of the C&D debris materials would be processed and diverted from landfills in accordance with recycling programs and policies, small quantities of municipal solid waste that would be produced from these construction projects would end up in landfills. The need to dispose of waste as part of the transportation network improvements would contribute to reduced capacity of landfills in the region, which may be insufficient to accommodate the region's waste disposal needs by 2050. Therefore, transportation network improvements would generate solid waste at a level that would exceed the capacity of permitted solid waste disposal facilities in the region and would require new or expanded solid waste disposal facilities. Transportation network improvements and programs would have a significant impact on the solid waste disposal system in 2050.

2050 Conclusion

Implementation of regional growth and land use change and transportation network improvements and programs in the proposed Plan by 2050 would generate solid waste and C&D debris that may not be accommodated by the regional landfills. Although, the forecasted growth and network improvements would comply with programs, policies, and practices to reduce the rate of solid waste generation, this impact (U-2) in the year 2050 would be significant.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects related to excess generation of solid waste.

MITIGATION MEASURES

2035 and 2050

U-2a Implement Mitigation Measures for New/Expanded Solid Waste Facilities. During planning, design, and project-level CEQA review of solid waste facility projects, the County of San Diego, cities, and other solid waste management agencies can and should apply necessary mitigation measures to avoid or reduce significant environmental impacts associated with the construction or expansion of new or expanded solid waste facilities. Significant environmental impacts requiring mitigation may include, but are not limited to, air quality, biological resources, cultural resources, energy, greenhouse gas emissions, hydrology and water quality, noise, paleontological resources, traffic, tribal cultural resources, and water supply. Mitigation measures may be similar to those described in this EIR for construction of development projects.

U-2b Reduce Construction Waste. During planning, design, and project-level CEQA review, and prior to the construction or demolition of transportation network improvement projects and development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, implement measures to reduce construction waste to comply with waste reduction goals identified by the state and local agencies, including but not limited to the following:

- Ensure that source reduction techniques and recycling measures are incorporated into project construction/demolition.
- Reuse and/or recycle construction and demolition waste.

This mitigation measure would extend the life of existing landfills and delay the need to construct new or expanded landfills.

U-2c Reduce Operational Waste. During planning, design, project-level CEQA review, and construction of development projects, the County of San Diego, cities, and other local jurisdictions can and should integrate green building waste management measures such as those identified in the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED), Energy Star Homes, Green Point Rated Homes, and the California Green Builder Program. These measures include, but are not limited to, the following:

- Prepare and apply a waste management plan that promotes solid waste diversion.
- Implement source reduction through (1) using materials that are more durable and easier to repair and maintain, (2) designing to generate less scrap material through dimensional planning, (3) increasing recycled content, (4) using reclaimed materials, and (5) using structural materials in a dual role as finish material (e.g., stained concrete flooring, unfinished ceilings, etc.).
- Reuse existing structures and shells in renovation projects.
- Design for flexibility through the use of moveable walls, raised floors, modular furniture, moveable task lighting, and other reusable building components.
- Develop an indoor recycling program and space.

These mitigation measures would extend the life of existing landfills and delay the need to construct new or expanded landfills.

SIGNIFICANCE AFTER MITIGATION

2035 and 2050

Implementation of the proposed Plan would result in significant impacts related to the construction of new or expanded solid waste facilities in 2035 and 2050. Implementation of mitigation measure U-2a would reduce these impacts through project-level planning, design, and CEQA mitigation measures. Mitigation measures U-2b and U-2c would further reduce this impact by extending the life of existing landfills and delaying the need to construct new or expanded landfills or landfill capacity. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, this impact (U-2) would remain significant and unavoidable.

4.16 TRANSPORTATION

This section evaluates the transportation impacts of the proposed Plan.

4.16.1 EXISTING CONDITIONS

The San Diego regional transportation system is a complex and expansive multimodal network that supports the demand for personal travel and is the backbone of the region's economic base. The transportation network connects residents and visitors to places of employment, education, shopping, recreation, and residences. The transportation network is also essential for the movement of goods and continued economic development.

The transportation system includes interstates and state highways, arterial roadways, local roadways, public transportation systems, nonmotorized transportation facilities, maritime and aviation facilities, and land ports of entry (POEs). The regional roadway system is an interconnected network of freeways, state highways, toll roads, arterial roadways, and local roadways. The roadway network allows for the movement of personal vehicles, micromobility transports, bicycles, buses, commercial vehicles, ride-share services, and heavy trucks. The regional public transit system includes local and regional bus operations, regional and interregional commuter rail services, and light rail service. The freight railroad network includes two freight rail corridors distributing cargo and goods services. Nonmotorized transportation facilities generally include walkways and bikeways. Often bikeway facilities such as bike routes, bike lanes, and cycle tracks are located within the roadway right-of-way. Shared facilities such as multi-use paths are generally not associated with a roadway facility. The airport system consists of commercial, general, and military aviation facilities serving passenger, freight, business, recreational, and military needs. Individual components of the regional transportation network are described in the following sections.

Both the current (Year 2021)[1] and Baseline Year (Year 2016) conditions of the region's transportation network are discussed in the following sections. The SANDAG updated second generation Activity Based Model[2] (ABM2+) was calibrated to Year 2016 conditions under its base year scenario. The ABM2+ is the most up-to-date transportation forecast within the San Diego region and is the best tool in which the metrics used to evaluate effects of land use growth and transportation network improvements can be measured at a regional level, including activity and tour (trip) generation, mode split, average trip length, and vehicles miles traveled (VMT). As such, the majority of the transportation impact analysis presented in Section 4.16.4 was conducted using the ABM2+ and utilizes Year 2016 as the base year scenario. It should be noted that transportation conditions evolve slowly over time and only minor changes in the network usually occur over a 5-year period. Therefore, as shown in the following sections, the differences between the Baseline Year 2016 and current

[1] In some cases Year 2021 data was not yet available, under these circumstance data from the year that is most current is provided.

[2] The SANDAG Series 14 Regional Growth Forecast is the long-range forecast of population, housing, and employment that was inputted into ABM2+ for the proposed Plan. The Sustainable Communities Strategy (SCS) land use pattern is a subregional allocation of forecasted growth and development (population, housing, and jobs) based on the Series 14 Regional Growth Forecast. Data used to develop the SCS land use pattern are based on the most recent planning assumptions, considering local general plans and other factors, per California Senate Bill 375 (Steinberg, 2008) (SB 375) (Government Code Section 65080[b][2][B]). Additional information regarding the background, data sources and methodologies used within the ABM2+ can be found through the following resource:
https://www.sandag.org/index.asp?subclassid=120&fuseaction=home.subclasshome.

conditions are minor (less than 8% for any facility type) and would not affect the overall findings of the transportation impact analysis.

ROADWAY NETWORK

The primary purpose of the roadway network (Figure 4.16-1) is to facilitate the movement of people and goods. The roadway network within the region serves many purposes and can accommodate several modes of travel, such as buses, personal automobiles, commercial automobiles, the movement of freight, and bicycles and micromobility vehicles. Local streets and arterials traverse communities and are typically used for shorter trips, while the region's freeways and state highways provide access to major job centers, education, recreation, and travel to destinations outside the region. The regional roadway network is a complex and expansive system that is planned, designed, built, operated, and maintained by numerous agencies, such as the region's local jurisdictions, the California Department of Transportation (Caltrans), tribal governments, and SANDAG.

Table 4.16-1 summarizes the existing roadway network within the San Diego region.

Table 4.16-1
Existing Roadway Facilities in the Region

Facility Type	Year 2016		Year 2020	
	Centerline Miles	Lane Miles	Centerline Miles	Lane Miles
Freeway – General Purpose~~Freeway – General Purpose~~	335	2,415	335	2,417
Freeway – Managed Lanes~~Freeway – Managed Lanes~~	39	116	39	116
Tollway~~State Highways~~	10	46	11	48
State Highways~~Regional Arterial Network~~	275	628	275	656
Regional Arterial Network~~Local Roadways~~	1,052	3,718	1,055	3,793

Source: ABM2+ Base Year and Year 2020 Transportation Network
Note: Centerline Miles = total miles of roadway type, regardless of the number of lanes provided; Lane Miles = total miles of roadway multiplied by the number of lanes along each segment.

As shown in Table 4.16-1, the total freeway centerline miles ~~and lane miles~~ did not increase between Year 2016 and Year 2020, while the total number of lane miles only increased by 2 miles. State highways, regional arterials, and local roadways saw only a nominal increase in both centerline miles (less than 1 percent) and lane miles (2 percent) over the same period.

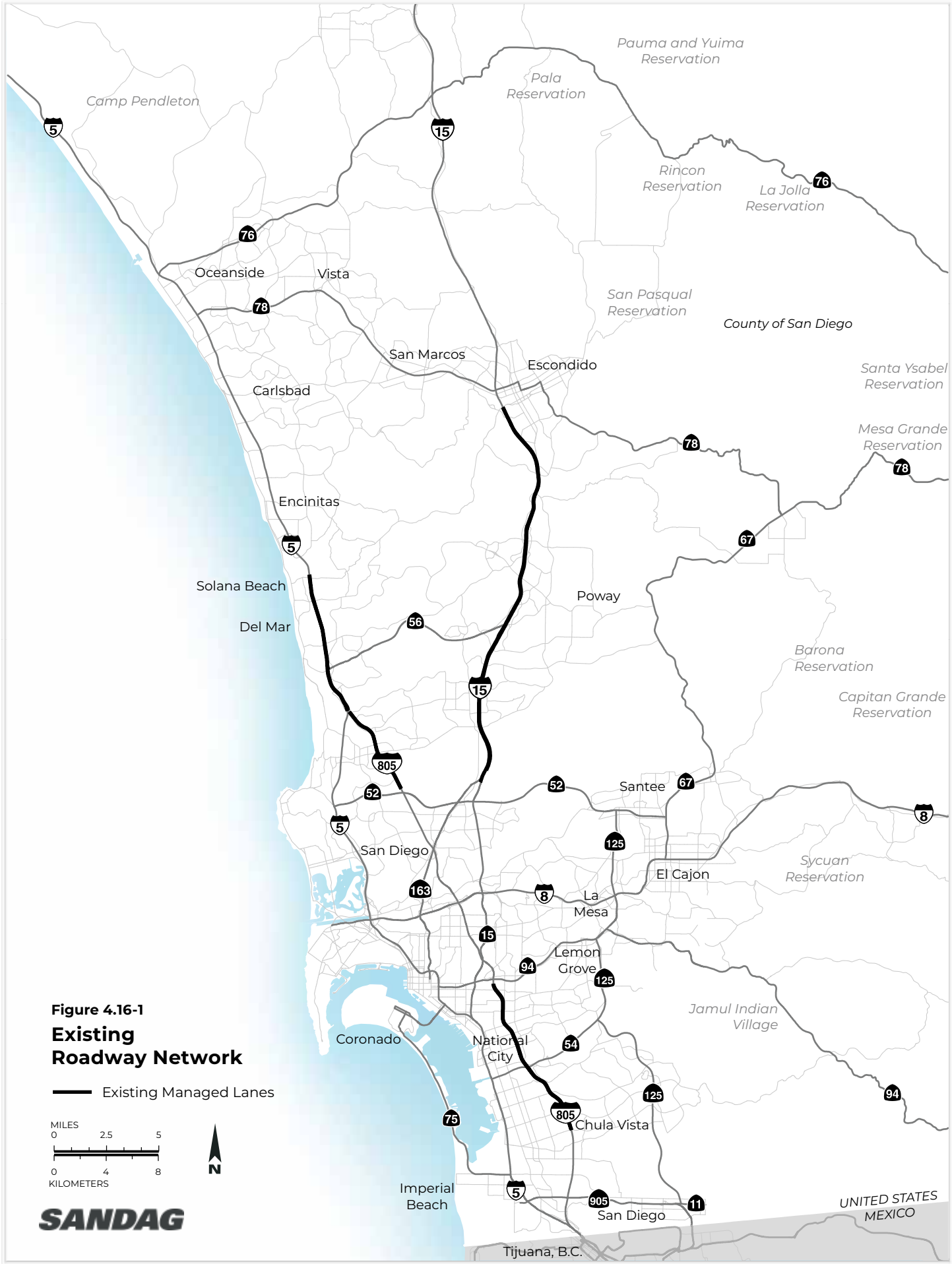


Figure 4.16-1

Existing Roadway Network

Existing Managed Lanes

PUBLIC TRANSIT

The primary forms of public transportation throughout the San Diego region are commuter rail, light rail, Bus Rapid Transit (Rapid),[3] and local and express bus services. Additionally, on-water transit services, such as ferries and water taxis, are operated within San Diego Bay, connecting between Downtown San Diego and Coronado. The existing transit network is depicted on Figure 4.16-2. Generally, these forms of public transit are centered in the western portion of the region, near the more densely populated coastal communities and commuter corridors. Many of the less dense and rural communities in the eastern portion of the region have limited access to regional public transportation. The commuter rail, light-rail, Rapid, and bus services within the region are primarily provided by Metropolitan Transit System (MTS) and North County Transit District (NCTD). It should be noted that the transit scheduling and headway information presented below represent conditions prior to the State's COVID-19 Stay-at-Home Order. As of mid-2021, transit service in the region is at near pre-pandemic levels.

Light Rail

Throughout the San Diego region, light rail service is provided by NCTD and MTS. The NCTD SPRINTER is a diesel-powered, light rail system that travels a 22-mile east-west route serving 15 stations connecting Oceanside, Vista, San Marcos, and Escondido generally along the State Route (SR) 78 corridor. The SPRINTER operates every 30 minutes in each direction, Monday through Friday, from approximately 4 a.m. until 9 p.m. Trains on Fridays and Saturdays run later, and trains on Saturdays, Sundays, and holidays operate every 30 minutes from 10 a.m. until 6 p.m. and hourly before and after those hours (NCTD 2018c).

The San Diego Trolley is a light rail passenger service operated by San Diego Trolley, Inc., which is owned by MTS. The San Diego Trolley system consists of four lines, including the UC San Diego Blue Line, Orange Line, Sycuan Green Line, and SDG&E Silver Line. There are 53 trolley stations within the region, connected by 54.3 miles of rail (MTS 2016b). Each of these four lines is described below:

- The UC San Diego Blue Line currently covers 15.4 miles and includes 18 stations, extending between Santa Fe Depot in Downtown San Diego and the San Ysidro transit station at the international border with Mexico, via National City and Chula Vista. Construction is currently under way to extend the Blue Line north to the University City community, also referred to as the Mid-Coast Corridor, and will serve major activity centers such as the University of California San Diego (UCSD) and Westfield University Town Center (UTC). Service is anticipated to begin in November 2021. The Blue Line currently runs at 7- to 8-minute headways during peak periods and 15-minute headways in off-peak periods Monday through Sunday. Late night service (after 11 p.m.) on this line runs every 30 minutes.
- The Orange Line currently covers 18 miles and includes 19 stations, extending from Santa Fe Depot in Downtown San Diego to the El Cajon Transit Center via southeastern San Diego, Lemon Grove, and La Mesa. The Orange Line currently runs at 7- to 8-minute headways during peak periods (between the Spring Street Station and City College station) and 15-minute headways in off-peak times until 8:15 p.m. when headways increase to 30 minutes Monday through Friday. On Saturdays and Sundays the Orange Line currently runs at 15-minute headways during midday, and 30-minute headways during mornings and evenings.

[3] MTS brands bus services that fully or partially operate in an exclusive right-or-way or managed lanes, similar to bus rapid transit services, as "Rapid."

- The Sycuan Green Line services 23.6 miles and includes 27 stations, operating from the 12th and Imperial Station in Downtown San Diego to the Old Town Transit Center via the bayside alignment, then east to Santee Town Center via Mission Valley and San Diego State University (SDSU). The Green Line operates a 15-minute service during peak times Monday through Friday and midday Saturdays, and a 30-minute service during other times of the day.
- The SDG&E Silver Line is a 2.7-mile loop through Downtown San Diego that is traveled by a restored 1946 Presidents' Conference Committee (PCC) streetcar, also referred to as the Vintage Trolley, operated by MTS. The Silver Line Vintage Trolley departs from the 12th and Imperial Station along the Green Line to America Plaza and then along the Blue/Orange Line back to the 12th and Imperial Station. The Silver Line Vintage Trolley operates on a limited schedule and currently departs every 30 minutes during select hours on Friday through Sunday.

Rapid

MTS currently operates eight Rapid bus routes within the southern portions of the County while NCTD operates one Rapid bus route in the north. It should be noted that the current Rapid bus routes partially operate within an exclusive right-of-way, as is more typical with Bus Rapid Transit services. The current Rapid bus services provide high-frequency, limited-stop bus service from various transit centers within the region to Downtown or one of the major universities within the region (UCSD, SDSU, and the University of San Diego).

Bus

MTS operates approximately 87 fixed-bus routes and Americans with Disabilities Act (ADA) complementary paratransit service throughout its service area. MTS's service area primarily covers the central and southern portions of the San Diego region. Fixed route bus service includes local, urban, express, premium express, and rural routes (MTS 2016). Bus services are provided by the San Diego Transit Corporation, which is owned by MTS. MTS bus service extends from the international border to as far north as Escondido. All MTS buses are equipped with a lift or a ramp for boarding mobility impaired riders.

The NCTD bus system, known as the BREEZE, serves the northern San Diego region. BREEZE operates approximately 37 bus routes from Oceanside south to La Jolla/UTC, southeast to Escondido, northeast to Pala, and north to Fallbrook (NCTD 2018a). NCTD also provides an on-demand FLEX bus service, which includes routes to Ramona and Marine Corps Base (MCB) Camp Pendleton. The NCTD service area also includes four Native American reservations governed by the Rincon Band of Luiseño Indians, Pala Band of Mission Indians, Pauma Band of Luiseño Indians, and San Pasqual Band of Diegueno Mission Indians. NCTD's BREEZE buses are all accessible to persons with disabilities. All buses are equipped with a lift or ramp for boarding mobility impaired riders. Additionally, NCTD services include the LIFT paratransit service, which provides origin-to-destination service for people with disabilities unable to use BREEZE buses or rail services.

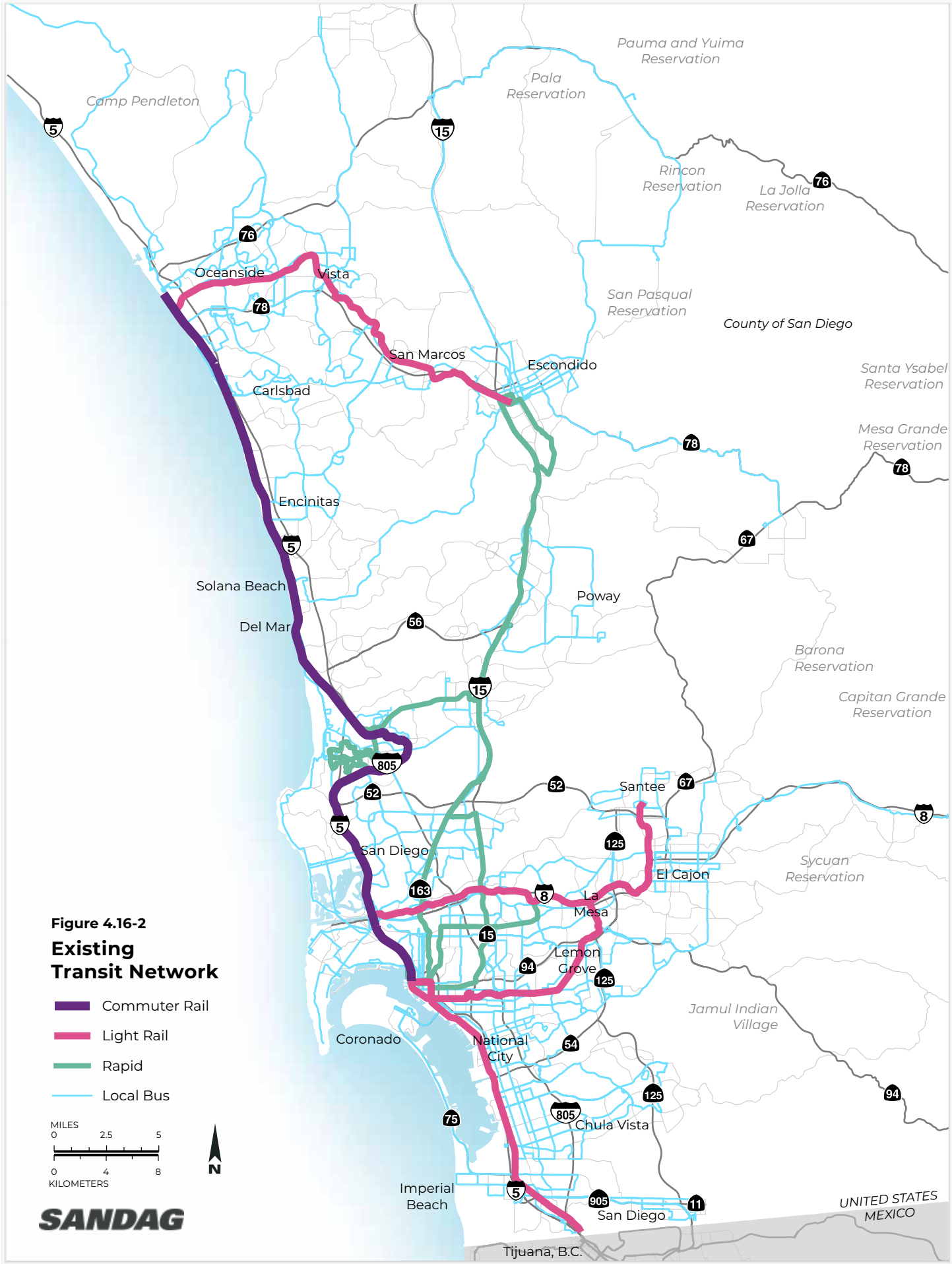


Figure 4.16-2

Existing Transit Network

Passenger and Regional Commuter Rail

Throughout the San Diego region, passenger and commuter rail services are provided by Amtrak, NCTD, and Metrolink, all of which travel along different segments of the Los Angeles–San Diego–San Luis Obispo (LOSSAN) rail corridor. The LOSSAN rail corridor is the second busiest intercity passenger rail corridor in the United States and the busiest state-supported Amtrak route. The LOSSAN rail corridor service includes 41 stations and more than 150 daily passenger trains, with an annual ridership of nearly 3 million on Amtrak Pacific Surfliner intercity trains and 5 million on Metrolink and COASTER commuter trains.

The Pacific Surfliner provides intercity connections between downtown San Diego, Orange County, Los Angeles, Santa Barbara, and San Luis Obispo. It also connects to the nationwide rail system via Union Station in Los Angeles. The Pacific Surfliner offers 11 daily round trips from San Diego to Los Angeles Union Station (12 on weekends), and 5 round trips from Los Angeles to Goleta (just north of Santa Barbara), with 2 daily trips extending to San Luis Obispo.

The COASTER is operated by NCTD and also travels along the LOSSAN rail corridor. The COASTER provides passenger commuter rail service with eight stops along 41 miles of track between downtown San Diego and Oceanside. The COASTER primarily serves commuters on weekdays, with more than 20 trains scheduled during typical commute hours. The COASTER operates 7 locomotives and 28 bi-level coaches (NCTD 2018e).

Metrolink is a regional passenger commuter rail service that operates within the LOSSAN rail corridor. Metrolink was formed by the Southern California Regional Rail Authority. The Metrolink system consists of seven routes with 62 stations along 538 route miles (includes shared miles). Metrolink operates an average of 173 trains on weekdays with 38,436 average weekday riders. On weekends, Metrolink operates an average of 48 trains on Saturdays and 42 trains on Sundays. The only Metrolink station within the San Diego region is located in Oceanside, and it runs along the Orange County Line. The Orange County Line (which runs from Oceanside to Los Angeles) has 15 stations and 87.2 route miles, with an average of 29 weekday trains in operation (Metrolink 2018).

Micro-Transit

Micro-transit is a service that offers flexible routing and/or flexible scheduling of minibus vehicles, which are typically electric powered. Possible pick-up/drop-off stops are restricted (usually within a geofenced area), and transit can be provided either as scheduled stop-to-stop service or on-demand curb-to-curb service. Free Ride Everywhere Downtown (FRED), which is operated by Circuit, is a local example of on-demand (via cell phone app) curb-to-curb service anywhere within Downtown San Diego. The Hillcrest Lunch Loop is an example of an as-scheduled stop-to-stop service. The Hillcrest Lunch Loop is funded through the Uptown Community Parking District and is also operated by Circuit. The loop operates Monday through Friday from 11:30 a.m. to 1:30 p.m., and has five stops, all within the Hillcrest Neighborhood.

Tables 4.16-2 and 4.16-3, summarize the Year 2016 and current transit services provided within the San Diego region, respectively. Year 2019 data is presented in Table 4.16-2b in-lieu of 2021 data, as it better reflects current and typical transit ridership conditions when the county is not under a Stay-at-Home Order.

Table 4.16-2
Year 2016 Transit Services in the Region

Agency	Type	Total Number of Routes	Total Route Miles	Total Number of Stops	Total Number of Major Stops	Average Daily Passengers[1]	Annual Passengers[2]	Daily Hours of Service[1]
MTS	Light Rail	3	57	53	53	120,630	39,614,897	502
	Rapid	8	140	63	63	23,795	6,601,784	622
	Bus	87	863	2,306	147	164,316	45,588,514	5,361
	Total	97	1,060	2,422	263	308,741	91,805,195	6,485
NCTD	Commuter Rail	1	41	8	8	5,196	1,556,056	57
	Light Rail	1	22	15	15	10,282	2,677,929	68
	Rapid	1	6	13	13	2,047	529,425	68
	Bus	35	456	903	--	27,176	7,028,651	1,404
	Lift	--	--	--	--	795	213,603	--
	Total	39	525	939	36	44,701	12,005,664	1,597

Source: ABM2+ Transit Network

[1] National Transit Database Fiscal Year (FY) 16

[2] Passenger Count Program (PCP) FY16 and FY19

Table 4.16-3
Year 2019 Transit Services in the Region

Agency	Type	Total Number of Routes	Total Route Miles	Total Number of Stops	Total Number of Major Stops	Average Daily Passengers[1]	Annual Passengers[2]	Daily Hours of Service[1]
MTS	Light Rail	3	57	54	54	114,740	37,293,757	501
	Rapid	9	156	71	71	24,382	6,702,576	664
	Bus	89	815	2,194	144	148,362	40,784,499	5,530
	Total	101	1,028	2,319	269	287,484	84,780,832	6,695
NCTD	Commuter Rail	1	41	8	8	4,920	1,408,677	57
	Light Rail	1	22	15	15	8,226	2,408,962	77
	Rapid	1	6	13	13	1,735	448,649	68
	Bus	32	436	886	--	23,030	5,956,274	1,332
	Lift	--	--	--	--	629	169,053	--
	Total	35	505	922	36	38,691	10,391,615	1,534

Source: ABM2+ Transit Network

[1] National Transit Database FY16

[2] Passenger Count Program (PCP) FY16 and FY19

As shown in the tables, the total route miles of transit service slightly decreased between 2016 and 2019, with both MTS and NCTD reducing their route miles by approximately 3percent.

ACTIVE TRANSPORTATION

Active transportation facilities within the region include bicycle facilities such as bike routes, bike lanes, cycle tracks, and multi-use paths, as well as pedestrian facilities such as sidewalks, pedestrian bridges, and pathways. Active transportation also includes micromobility transports such as electric scooters, e-bikes, bikeshare, and Neighborhood Electric Vehicles (NEVs).

Bicycle Facilities

The San Diego regional bicycle network is composed of the following five main facility types:

- **Class I Multi-Use Path:** Also referred to as a *bike paths* or *multi-use paths*, Class I facilities provide a completely separated right-of-way designed for the exclusive use of bicycles and pedestrians with crossflows by motorists minimized. Multi-use paths can provide connections where roadways are non-existent or unable to support bicycle travel. The minimum paved width for a two-way, multi-use path is considered to be an 8-foot paved pathway with a 2-foot-wide graded area adjacent to either side of the pavement (12 feet total width).
- **Class II Bike Lane:** This facility provides a striped lane designated for the exclusive or semi-exclusive use of bicycles, with through travel by motor vehicles or pedestrians prohibited. Bike lanes are one-way facilities located on either side of a roadway. Pedestrian and motorist crossflows are permitted across bike lanes at intersections and driveways. Additional enhancements such as painted buffers and signage may be applied. The minimum bike lane width is considered to be 5 feet.
- **Class III Bike Route:** This facility provides shared use of traffic lanes with cyclists and motor vehicles, identified by signage and/or street markings such as "sharrows." Bike routes are best suited for low-speed, low-volume roadways with an outside lane of 14 feet or greater. Bike routes provide network continuity or designate preferred routes through corridors with high demand.
- **Class IV Cycle Track:** Also referred to as *separated* or *protected bikeways*, cycle tracks provide a right-of-way designated exclusively for bicycle travel within the roadway. Cycle tracks are physically protected from vehicular traffic both horizontally, through a buffered area, as well as vertically, utilizing treatments such as grade separation, flexible posts, bollards, railings, art pieces, or on-street parking. Cycle tracks can provide for one-way or two-way travel. A one-way cycle track has a minimum 5-foot-wide travel lane with a 3-foot buffer (8 feet in total), while a two-way cycle track has a minimum 8-foot-wide travel way with a 3-foot buffer (11 feet in total).
- **Bike Boulevard:** Bicycle Boulevards are streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Bicycle Boulevards use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets. It should be noted that Bicycle Boulevards are not separately distinguished in the Caltrans *Highway Design Manual* from Class III Bicycle Routes. However, the National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide* does recognize Bicycle Boulevards as a separate form of classification.

There are approximately 1,710 miles of existing bikeway facilities in the region, as detailed in Table 4.16-4. Class II facilities are the predominant type of bikeway at roughly 67 percent of the total, followed by Class III facilities at 21 percent. Class I facilities compose about 11 percent of the regional total and Class IV Cycle Tracks

compose one percent. While there are currently no Bicycle Boulevards within the San Diego region, two projects are currently under construction by SANDAG in the North Park Mid-City areas: the Georgia-Meade and Landis Bikeways. Figure 4.16-3 shows the existing off-street bicycle network throughout the San Diego region.

Table 4.16-4
Existing Bicycle Facilities in the Region

Facility Type	Year 2016		Existing (2020) Conditions	
	Total Lane Miles[1]	Percentage of Total	Total Lane Miles[1]	Percentage of Total
Class I Multi-Use Path	359.5~~166~~	11.6%~~11%~~	378.9~~189~~	11.3%~~11%~~
Class II Bike Lane	2,101.0~~1,039~~	67.5%~~66%~~	2,257.3~~1,145~~	67.2%~~67%~~
Class III Bike Route	642.3~~349~~	20.6%~~22%~~	702.2~~363~~	20.9%~~21%~~
Class IV Cycle Track	9.3~~20~~	0.3%~~1%~~	20.9~~13~~	0.6%~~1%~~
Bike Boulevard	0.0	0.0%	0.0	0.0%
Total	~~1,574~~3,112.2	100.0%	~~1,710~~3,359.3	100.0%

Source: ABM2+
[1] The reporting of bicycle facilities was converted from total centerline miles (provided in the Draft EIR) to total lane miles, based on public comments.

As shown in the table, the ratio of facility types stayed rather consistent between 2016 and 2021; however, there was an 8 percent increase in the total miles of facilities over this same time period.

Micromobility

Micromobility refers to small, lightweight travel devices that generally travel short distances at low speeds. In the San Diego region popular micromobility devices include dockless bikeshare, e-bike share, electric scooters (e-scooters), and NEVs. Dockless bikeshare, e-bike share, and e-scooters are located and rented via smartphone apps that allow users to pick-up and return bicycles, electric bicycles, or e-scooters anywhere within a designated area, generally designated via a geofence.[4] Similar to bicycles, e-scooters are not allowed to be ridden on the sidewalk and are required to either be within a bike facility, such as a bike lane, or in the outside travel lane of the roadway.

A NEV is a small electric vehicle that typically operates within a defined service area and fulfills trips that cover a short-distance, typically less than 2 miles. NEVs help to facilitate connections to and from transit stations and provide users with an alternative to driving for short trips. NEVs are generally available to rent through public sharing programs, or through personal ownership. There are currently no NEV sharing programs operating within the San Diego region. NEVs are allowed to be driven within the travel lane of roadways with speed limits that do not exceed 35 miles per hour (mph) (California Vehicle Code Sections 385.5 and 21260); however, they generally have a maximum speed of 25 mph. Along higher speed roadways, NEVs are permitted to drive within the bike lane, if adequate width is provided, or within designated facilities.

[4] A geofence is a virtual geographic boundary, defined by global positioning system (GPS) or radio-frequency identification (RFID) technology, that enables software to trigger a response when a mobile device enters or leaves a particular area.

Figure 4.16-3

Existing Bicycle Network

Pedestrian Facilities

Walking is also a part of an active transportation network. Pedestrian facilities primarily include sidewalks and crosswalks associated with arterials and roadways, as well as bridge and other connections across highways and rail facilities.

In September 2010, SANDAG began engaging key stakeholders and the region's residents in the development of the Draft Regional Safe Routes to School Strategic Plan; the final Strategic Plan was accepted by the SANDAG Transportation Committee on March 2, 2012. The Regional Safe Routes to School Strategic Plan aims to make walking and bicycling to school safer and to provide more attractive travel choices for families throughout the region. The plan identifies a regional strategy to support local communities in establishing new Safe Routes to School programs as well as sustaining and enhancing existing efforts (SANDAG 2018c).

Improving safety conditions is a central goal of Safe Routes to School programs, which can be accomplished by improving the built environment, educating students, engaging community members, enforcing traffic laws, and instituting programs designed to address personal security concerns. Safe Routes to School programs support more sustainable, compact, well-designed communities interconnected by a transportation system that expands travel choices and reduces greenhouse gas (GHG) emissions. Safe Routes to School programs also help achieve this vision by reducing peak period vehicle trips and providing active transportation to school with more viable and attractive options. Addressing school safety and accessibility improves the overall walkability of affected neighborhoods (SANDAG 2012).

It should be noted that trail facilities are also considered part of the pedestrian network.[5] The trail facilities within the San Diego region are further described and analyzed in Section 4.15, *Public Services and Utilities*, of this EIR, along with other recreational facilities.

PARKING

On- and off-street parking within the San Diego region is generally regulated within each local jurisdiction's municipal code. Caltrans also provides Park-N-Ride locations at strategic points along the region's freeway network, as well as joint locations, with transit agencies (MTS and NCTD), at major transit stations. While SANDAG does not regulate public or private parking within the region, they do provide support and resources for the local jurisdictions to optimize their parking management practices and regulations. SANDAG developed a *Parking Strategies for Smart Growth* guide as part of their *Planning Tools for the San Diego Region* (SANDAG 2010a). This guide provides a benchmark and compares the various parking regulations within the region, as well as how those regulations compare to national standards. Additionally, the guide provides example policies on how jurisdictions can implement smart growth parking policies and programs. SANDAG also developed a regional parking management toolbox that provides jurisdictions within the San Diego region with a framework for evaluating, implementing, and managing parking management strategies that support their economic development, sustainability, and mobility goals (SANDAG 2014).

[5] The United States Access Board has identified four Conditional Exceptions for when ADA standards do not need to be applied to trail facilities, as identified in the *Accessibility Standards for Federal Outdoor Developed Areas* (May 2014). Further detail is provided through the following link: https://www.access-board.gov/files/aba/guides/outdoor-guide.pdf.

SANDAG's iCommute program, which focuses on Transportation Demand Management (TDM) strategies, also contains parking management programs and opportunities that employers and jurisdictions can use to better manage their parking demand. The iCommute program currently offers vanpool/carpool assistance, ride matching programs, and telework programs to assist employers with transportation and parking demand management.

AIRPORTS

The San Diego region is home to 16 public-use and military airports, as shown on Figure 4.9-2 in Section 4.9, *Hazards and Hazardous Materials*. Located adjacent to Downtown San Diego, the San Diego International Airport (SDIA) is the busiest single-runway commercial service airport in the nation. The airport served approximately 25 million passengers in 2019 and hosted 22 passenger carriers and five cargo carriers.

Other regional airports include Oceanside Municipal Airport, McClellan-Palomar Airport, Montgomery Field, Gillespie Field Airport, and Brown Field Municipal Airport. Rural airfields, generally located in the eastern portion of the San Diego region, include Fallbrook Community Airpark, Ramona Airport, Borrego Valley Airport, Ocotillo Airport, Agua Caliente Airport, and Jacumba Airport. Military airfields in the region include Marine Corps Air Station Camp Pendleton, Marine Corps Air Station Miramar, Naval Air Station North Island, and Naval Outlying Field Imperial Beach (SDIA 2019).

GOODS MOVEMENT AND FREIGHT

The movement of goods and freight throughout the San Diego region is an important component to the region's transportation operations. The San Diego region's location is critical in the international transport of goods through multiple international POEs, with Mexico to the south and the Ports of Los Angeles and Long Beach to the north, which combined make up the San Pedro Bay Port Complex, the ninth busiest container port complex in the world (Port of Los Angeles 2018). The San Diego region is also home to two international marine terminals, the National City Marine Terminal (NCMT) and the Tenth Avenue Marine Terminal (TAMT).

Truck

The predominant mode in San Diego's diverse and expansive goods movement network is commercial trucking. Trucking has played a pivotal role in enabling the region to harness the economic benefits of growing international trade. In 2019, Mexico became the United States' top overall trade partner. Currently, more than 90 percent of California-Mexico trade is moved by truck. In 2019, the Otay Mesa and Tecate POEs processed a combined $48.3 billion in total bilateral trade, and that number is expected to grow over the coming years (SANDAG 2021b). The most common commodities that cross the California–Mexico border by truck are high-value items such as electronics, medical devices, and automobiles. These commodities are expected to continue to dominate cross-border trade, especially with the passage of the United States–Mexico–Canada (USMCA) Trade Agreement. International trade, however, accounts for only a portion of the goods that trucks carry through San Diego County. Freight traveling within the county or to/from other domestic locations accounts for more than 85 percent of the truck tonnage on the region's interstate freeways, highways, and local roads, approximately 50 million tons per year (SANDAG 2016).

Rail

In addition to commercial truck crossings, San Diego also has a rail freight crossing at its San Ysidro Port of Entry, where the Main Line—owned by the MTS subsidiary San Diego and Arizona Eastern Railway Company (SD&AE)—terminates. Freight on this short line is operated by the San Diego and Imperial Valley Railroad

(SDIV). A defunct rail crossing, which would connect the SD&AE Main Line through the Tijuana, Tecate short line to the currently non-operational Desert Line, also exists about 5 miles east of the Tecate POE. While accounting for only a small portion of total cross-border trade, approximately $88 million of goods pass through San Diego's rail crossings. These rail imports consist primarily of agricultural goods and raw materials like stone, iron, and steel.

San Diego's rail infrastructure also carries a significant amount of domestic freight. Of the approximately 3,200 rail carloads carried by SDIV in 2019, about half are transported between locations other than the international border. The region is also served by the LOSSAN Rail Corridor, which carries approximately $1 billion of freight annually by its Class I freight operator, the Burlington Northern Santa Fe (BNSF) Railway Company (NCTD 2020).

Maritime

While the majority of imports that pass through the San Diego goods movement network complete a portion of their journey on trucks or trains, many international goods first arrive in the region by ship. Between the TAMT and the NCMT, more than 1.5 million metric tons of waterborne cargo is processed by San Diego's seaports annually (USACE 2019). In addition to standard shipping containers, San Diego's maritime ports are equipped to process breakbulk and refrigerated cargo. NCMT primarily handles lumber and automobiles, while TAMT receives a wider variety of goods, including fruit, sand/cement, and petroleum products. Both TAMT and NCMT have onsite rail connections and are minutes away from major freeways.

By providing the region with valuable goods and high-quality employment, the Port of San Diego is an important economic driver. A 2017 economic impact analysis found that industrial and maritime commerce at the port directly contributed 13,348 jobs and $2.65 billion in economic output to the county. With tourism activity and indirect economic benefits included, the Port of San Diego's total economic impact on the region is estimated to be over $9.4 billion (Port of San Diego 2019).

Air Cargo

Another way goods enter and leave San Diego County is through its airports. In addition to being the nation's busiest single-runway commercial airport, SDIA handled more than 150 thousand tons of cargo in 2019 (SDIA 2019). Mail makes up a significant portion of the cargo that arrives at the airport. Upon arrival, mail is trucked to offsite sorting facilities before being sent to its final destination. Unlike the region's maritime ports, which almost exclusively processes international goods, SDIA primarily handles domestic cargo.

Pipeline

Finally, San Diego's goods movement network also includes two privately owned pipelines that bring in about 700,000 tons of aviation fuel and gasoline per year.

FREIGHT RAIL

LOSSAN Rail Corridor: Freight rail services in the San Diego region are predominantly operated within the LOSSAN rail corridor by the BNSF Railway (LOSSAN 2007). The LOSSAN rail corridor covers a six-county coastal region spanning 351 miles along the Southern California coast, with over 60 miles located in the San Diego region. In 2008, the Pacific Sun Railroad began serving freight in the region, particularly freight customers of the Escondido subdivision and the Miramar industrial spur (Watco 2018). As noted above under *Public Transit*, passenger and commuter rail services also operate within the LOSSAN rail corridor.

SD&AE Rail Corridor: This corridor straddles the international border with Mexico, connecting San Diego, Tijuana, Tecate, and the Imperial Valley. The U.S. section of the railroad is owned by MTS, and the 44.3 miles in Mexico are owned by the Mexican national railway, Ferrocarril Sonora-Baja California Railroad. The SD&AE runs on four lines totaling 108 miles, each of which are described below (MTS 2013).

- *Main Line* – Extends from Center City San Diego south to San Ysidro/International Border at Tijuana with a total length of 15.5 miles. This line extends through Mexico (44.3 miles) and connects with the Desert Line (see below).
- *La Mesa Branch* – Extends from downtown San Diego east to the city of El Cajon (though the City of La Mesa) with a total length of 16.1 miles.
- *Coronado Branch* – Extends from National City south to Imperial Beach with a total length of 7.2 miles. The Coronado Branch is currently not in use.
- *Desert Line* – Extends north and east from the International Border (junction called Division) to Plaster City with a total length of 69.9 miles, where it joins the Union Pacific Line from El Centro. The Desert Line is currently not in use; however, efforts are currently being made to rehabilitate degraded portions of this line and start rail services again.

The SDIV Railroad currently provides freight services on the Main Line and La Mesa Branch (MTS 2013). Pacific Imperial Railroad, Inc. (PIR) previously operated the Desert Line beginning in 2012. However, on June 2, 2016, PIR and Baja California Railroad entered into a binational sublease agreement to pay for the reconstruction and operation of the Desert Line. Under the sublease agreement, Baja California Railroad was responsible for the railroad repair, maintenance, and operational obligations for the first 60 miles of the Desert Line (MTS 2016a). Since that time, however, PIR filed for bankruptcy, and MTS approved a new amended and restated 99-year lease agreement with Baja California Railroad in September 2017, and all of PIR's assets, including the Desert Line lease, were assigned to Baja California Railroad (MTS 2017).

The freight rail corridors within the region are displayed on Figure 4.16-4.

TRANSPORTATION PROGRAMS

Transportation programs generally combine physical and digital infrastructure to better manage the operations of the region's transportation network.

Transportation Demand Management

TDM refers to programs and strategies that manage and reduce traffic congestion during peak travel times. Typical TDM programs include carpooling and vanpooling; promoting alternative work schedules; teleworking; and increasing bicycle, pedestrian, and transit use. These programs are designed to reduce congestion and the overall VMT generated within the region. The main goal of TDM programs is generally to make more efficient use of the existing transportation network within the region and to better maximize the movement of people and goods.

The comprehensive TDM program for the San Diego region is the iCommute program, which is operated by SANDAG in cooperation with the region's 511 transportation information services. The goal of iCommute is to reduce traffic congestion during peak times, as well as decrease GHG emissions and other environmental pollutants, by reducing the number of commuters driving to work or school alone each day. The iCommute program pulls together trip-reduction strategies and state-of-the-art web tools to provide access to convenient transportation choices that reduce auto dependency, vehicle energy consumption, and emissions. Specific

programs and services provided by iCommute include a vanpool subsidy program, transit solutions, regional support for biking, a Guaranteed Ride Home program, information about teleworking, and bike and pedestrian safety program support for schools (SANDAG 2018b). TDM programs are discussed in additional detail in Chapter 2, *Project Description,* of this EIR.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.16-4
Freight Rail Corridors
Freight Rail Corridor
Source: San Diego Association of Governments (SANDAG)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Transportation System Management/Intelligent Transportation Systems

Transportation System Management (TSM) and Intelligent Transportation Systems (ITS) provide the means to effectively manage the overall transportation system, including the demands on the system. TSM/ITS use innovative technologies that maximize the efficiency of the transportation network and promote greater multimodal system efficiencies that support mode changes over time, which can ultimately lower GHG emissions. TSM/ITS components are discussed in additional detail in Chapter 2 of this EIR.

Active Transportation and Demand Management/Smart Intersection Systems Active Transportation

SANDAG is currently developing and implementing Active Transportation and Demand Management (ATDM) and Smart Intersection Systems (SIS). ATDM enables transportation operators to change how infrastructure and services are used as traffic conditions change. This technology also provides people with real-time travel information to help them decide how, where, and when to travel. SIS uses sensors, connected vehicle technology, and mobility applications to facilitate communication among users, which improves traffic flow, situational awareness, signal operations, and intersection safety.

Integrated Corridor Management

In 2010, SANDAG and its partners developed and implemented the Integrated Corridor Management (ICM) system. ICM connects the transportation operations systems for multiple jurisdictions along the northern section of the Interstate (I-) 15 corridor and has resulted in substantial improvements to its performance. ICM enables multiple systems to "talk" to each other and coordinate their operations to maximize efficiency regardless of which jurisdiction owns or operates the individual system. The ICM system also monitors changing roadway conditions and congestion based on real-time information, then generates automated response plans to address the situation. The system reevaluates and generates new response plans as traffic conditions change further. An ICM multimodal response plan can include several key features:

- Coordination of the I-15 Express Lanes system with Caltrans' changeable message signs, 511 traveler information, ramp meters, and arterial signal systems to bypass major incidents or manage daily congestion.
- System automation to monitor congestion and select action plans.
- Real-time action control changes to traffic signal and ramp meter timing to better manage traffic entering or exiting the freeway system and manage traffic signals across agencies.

As part of the ongoing ICM project, a coordinated detour messaging system was activated in April 2016 with 40 alternate route signs installed on surface streets along the I-15 corridor in the cities of Escondido, Poway, and San Diego. Should a major freeway incident occur, Caltrans overhead changeable message signs on I-15 will direct motorists off the freeway to avoid delays, and alternate route signs will guide motorists through surface streets and back onto the freeway as soon as possible.

Shared Mobility

Shared mobility options for carpooling and on-demand rideshare have increased in usage over the past decade. On-demand rideshare services are made possible by smartphone applications that allow users to request a ride in real time. The application-based services connect riders with drivers or other riders and facilitate the most efficient trips to their destinations.

- **Dynamic Carpooling**: Application-based service that matches drivers with empty seats to passengers seeking rides to similar destinations. This ridesharing service creates efficiency and reduces congestion but does not allow the users to make a profit. Examples of dynamic carpooling services in the region are Scoop and Waze Carpool (SANDAG 2018b).
- **Ridehailing Services:** Application-based services that allow users to request a ride from paid drivers, who generally utilize their personal vehicles. Ridehailing services are presented in a variety of ways, including "pooling" services that connect multiple riders to shared rides, or individual rides, which pick up and drop off riders at designated destinations. Uber and Lyft are the main ridehailing services operating in the San Diego region.
- **Carshare:** Application-based service that allows for the short-term rental of a fleet vehicle or a personal vehicle via a smartphone app. Round-trip carshares allow users to pick-up and return a vehicle to the same parking spot, while free-floating carshare services allow users to pick-up and drop-off vehicles anywhere within a designated service area. These types of services allow rentals by the hour or day. Peer-to-peer carshare services allow private vehicle owners to rent their car to users within their community. Zipcar and Getaround are the only publicly available carshare services currently operating in the San Diego region.

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

The San Diego region is likely to experience sea-level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, intense heat waves and annual average temperature increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix F.

Climate change could impact transportation infrastructure and operations, as well as transportation use behavior. For example, sea-level rise may cause erosion and increase the frequency or duration of flooding on roads, which disrupts functionality and damages infrastructure (County of San Diego 2018, Biging et al. 2012). An assessment of damage costs on city transportation infrastructure in Carlsbad found that bluff erosion could result in losses of $5.8 million by 2050 (Nexus Planning & Research 2017). Flooding and inundation on roads, railways, and in subway tunnels may cut off access to local transportation facilities and damage components exposed to more frequent inundation (ICLEI 2012, Biging et al. 2012). More frequent and intense rainfall may cause bridge scour due to erosion of sediment and increase streamflow, which could exacerbate bridge damage (Biging et al. 2012, Reidmiller et al. 2018). Also, saturated soils may destabilize the substructure of transportation infrastructure and cause pavement degradation (ICLEI 2012). Extreme events and higher sea levels could lead to longer driving times because some corridors might be cut off (Moser et al. 2012). Flooding could cause damage and delays at ports and airports, negatively affecting commerce and flight plans, and higher tides at ports could contribute to erosion and cause periodic traffic disruptions (Biging et al. 2012).

In addition to flooding, higher temperatures can damage pavements, railroad tracks, and other infrastructure, as well as present safety and health concerns for passengers and employees. Under extreme high temperatures, joints on bridges and highways may expand/contract and pavement may deteriorate more rapidly, and pavement binders may not remain intact (Reidmiller et al. 2018, WSP 2018). Rail tracks can buckle under high temperatures and airplanes may face challenges due to hot weather (Reidmiller et al. 2018). The impacts of climate change on transportation are complex. Although these impacts have been explored to some degree within the San Diego region, their extent is unknown.

These projected increases in climate impacts may increase maintenance requirements to repair damage to transit infrastructure and roadways. Extreme heat and precipitation events may also necessitate changes in maintenance schedules to work around heavy rainfall and protect outdoor workers from extreme heat (WSP 2018).

Additionally, higher temperatures and changes in precipitation may change patterns of transit ridership, bicycling, and walking (Melillo et al. 2014). The literature does not make conclusions about whether the impacts of climate change could increase or decrease VMT. If changes in climate cause people to drive rather than walk or take alternative forms of transit, it is possible that VMT would increase. However, if people adapt by moving closer to work or working from home, VMT may not increase.

Increasing wildfire frequency and intensity may pose threats to driver safety, operations, and infrastructure. Wildfires could cause additional traffic, block roads, and require detours, in addition to reducing visibility due to smoke (WSP 2018). Additionally, wildfires may contribute to landslide exposure, which can damage transportation infrastructure (WSP 2018).

4.16.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Moving Ahead for Progress in the 21st Century Act

The Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law by President Obama in 2012. MAP-21 was the first long-term highway authorization enacted since the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was passed in 2005. This act provided needed funds and transformed the policy and programmatic framework for investments to guide the growth and development of the nation's transportation infrastructure and included many important provisions intended to help the Federal Motor Carrier Safety Administration (FMCSA) in its important mission to reduce crashes, injuries, and fatalities involving large trucks and buses (FMCSA 2015). MAP-21 created a performance-based multimodal program to address challenges of the U.S. transportation system, including improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the transportation system and freight movement, protecting the environment, and reducing delays in project delivery. It built on the policies and programs established by the Intermodal Surface Transportation Efficiency Act of 1991.

Fixing America's Surface Transportation Act of 2015

The Fixing America's Surface Transportation (FAST) Act of 2015 was signed into law by President Obama on December 4, 2015. The FAST Act provides long-term funding certainty for surface transportation infrastructure planning and investment. Under the FAST Act, $305 billion was authorized over fiscal years 2016 through 2020 for highway; highway and motor vehicle safety; public transportation; motor carrier safety; hazardous materials safety; rail; and research, technology, and statistics programs. Additionally, the FAST Act incorporates changes to ensure the timely delivery of transportation projects by improving innovation and efficiency in project development, through the planning and environmental review process, to project delivery.

On September 30, 2020, the United States Senate approved H.R. 8337, the Continuing Appropriations Act, 2021 and Other Extensions Act, which provides fiscal-year 2021 appropriations to federal agencies for continuing projects and activities of the federal government. Included in this act is a 1-year, $13.6 billion extension of the FAST Act. As such, the Fast Act is now scheduled to expire on September 30, 2021.

U.S. Department of Transportation Regional Transportation Plan Requirements

Under federal transportation law, the U.S. Department of Transportation (DOT) requires that Metropolitan Planning Organizations (MPOs), such as SANDAG, prepare long-range regional transportation plans (23 United States Code [USC] 134). In federally designated air quality nonattainment or maintenance areas, the long-range transportation plan is to be updated at least every 4 years. The proposed Plan would be the latest update of the San Diego region's long-range transportation plan.

Federal requirements for long-range transportation plans include the following (23 USC 134(i)(2)):

- **Identification of Transportation Facilities:** An identification of transportation facilities (including major roadways, public transportation facilities, intercity bus facilities, multimodal and intermodal facilities, nonmotorized transportation facilities, and intermodal connectors) that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important national and regional transportation functions.
- **Performance Measures and Targets:** A description of the performance measures and performance targets used in assessing the performance of the transportation system.
- **System Performance Report:** A system performance report and subsequent updates evaluating the condition and performance of the transportation system with respect to the performance targets, including progress achieved by the MPO in meeting the performance targets in comparison with system performance recorded in previous reports.
- **Mitigation Activities:** A discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan. The discussion must be developed in consultation with federal, state, and tribal wildlife, land management, and regulatory agencies.
- **Financial Plan:** A financial plan that demonstrates how the adopted transportation plan can be implemented, indicates resources from public and private sources that are reasonably expected to be made available to carry out the plan, and recommends any additional financing strategies for needed projects and programs. For the purpose of developing the transportation plan, the MPO, transit operator, and state must cooperatively develop estimates of funds that will be available to support plan implementation.
- **Operational and Management Strategies:** Operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods.
- **Capital Investment and Other Strategies:** Capital investment and other strategies to preserve the existing and projected future metropolitan transportation infrastructure, provide for multimodal capacity increases based on regional priorities and needs, and reduce vulnerability of the existing transportation infrastructure to natural disasters.
- **Transportation and Transit Enhancement Activities:** Proposed transportation and transit enhancement activities including consideration of the role that intercity buses may play in reducing congestion, pollution, and energy consumption in a cost-effective manner and strategies and investments that preserve and enhance intercity bus systems, including systems that are privately owned and operated.

Also, Regional Transportation Plans (RTPs) must be financially realistic (i.e., account for revenue constraints), balancing capital and operating costs with reasonable revenue expectations, as agreed upon by MPOs and their transportation agency partners in the planning process (23 Code of Federal Regulations 450.324).

Additionally, in metropolitan areas that are in nonattainment for ozone (O_3) or carbon monoxide (CO) under the federal Clean Air Act (CAA), the MPO must coordinate the development of a transportation plan with the process for development of the transportation control measures of the State Implementation Plan required by the CAA. In each metropolitan area, the MPO must consult, as appropriate, with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of a long-range transportation plan. Each MPO must provide individuals, affected public agencies, representatives of public transportation employees, public ports, freight shippers, providers of freight transportation services, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties with a reasonable opportunity to comment on the transportation plan. A transportation plan involving federal participation must be published or otherwise made readily available by the MPO for public review.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

Road Repair and Accountability Act of 2017

Senate Bill (SB) 1, also referred to as the Road Repair and Accountability Act of 2017, was signed into law on April 28, 2017, increasing transportation funding and instituting reforms. SB 1 includes an annual investment of $5.4 billion to repair roads, freeways, and bridges in communities throughout the state. SB 1 is intended to address a backlog of repairs and upgrades to the state's transportation facilities, while simultaneously ensuring a sustainable travel network for the future. Funds from SB 1 are split equally between State and local investments.

Active Transportation Program

Pursuant to SB 99 (Chapter 359, Statutes of 2013) and Assembly Bill (AB) 101 (Chapter 354, Statutes of 2013), the Active Transportation Program (ATP) was created to encourage increased use of active modes of transportation, such as biking and walking. The ATP consolidates various federal and State transportation programs, including the Transportation Alternatives Program, Bicycle Transportation Account, and State Safe Routes to School, into a single program with a focus to make California a national leader in active transportation (Caltrans 2018). The ATP is administered jointly by the California Transportation Commission (CTC) and Caltrans and combines many federal and State funding streams previously used for bicycle, pedestrian, safety, and other related purposes into one funding stream. In 2017, the Road Repair and Accountability Act (SB 1) added approximately $100 million per year in additional funds for the program (SANDAG 2018d). The purpose of the ATP includes the following:

- Increase the proportion of biking and walking trips.
- Increase safety for non-motorized users.
- Increase mobility for non-motorized users.
- Advance the efforts of regional agencies to achieve greenhouse gas reduction goals.
- Enhance public health, including the reduction of childhood obesity through the use of projects eligible for Safe Routes to Schools Program funding.
- Ensure disadvantaged communities fully share in program benefits (25 percent of program).
- Provide a broad spectrum of projects to benefit many types of active transportation users.

California RTP Requirements

In addition to federal requirements, MPOs are required to prepare RTPs that also meet State requirements. California Government Code Sections 65080 et seq. state that each MPO must prepare and adopt an RTP directed at achieving a coordinated and balanced regional transportation system, including, but not limited to, mass transportation, highway, railroad, maritime, bicycle, pedestrian, goods movement, and aviation facilities and services. The plan must be action-oriented and pragmatic, considering both the short- and long-term future, and must present clear, concise policy guidance to local and State officials. The RTP must consider factors specified in Section 134 of Title 23 of the United States Code, and each transportation planning agency must consider and incorporate, as appropriate, the transportation plans of cities, counties, districts, private organizations, and State and federal agencies.

Pursuant to California Government Code Section 14522, the CTC first adopted the RTP Guidelines in 1978 to help MPOs develop their RTPs consistent with federal and State transportation planning requirements. The guidelines are updated periodically on an as-needed basis. The 2010 update to the guidelines reflected revisions to address the planning requirements of SB 375 and other planning practices. In addition to addressing SB 375, the 2010 guidelines update set forth a uniform transportation planning framework throughout the state that identifies State and federal requirements for the development of RTPs. The updated guidelines recognize that the reduction of GHGs is a key priority in the transportation planning process. Since the 2010 update, two federal surface transportation reauthorization bills have been signed into law: MAP-21 (2012) and the FAST Act (2015). Consequently, CTC updated the RTP guidelines, and adopted the 2017 Regional Transportation Plan Guidelines for MPOs and Regional Transportation Planning Agencies on January 18, 2017. The 2017 guidelines were specifically updated to address the passage of AB 441 and changes to federal regulations as a result of MAP-21 and the FAST Act of 2015.

Additionally, the guidelines describe the RTP process, including State and federal requirements and consistency and coordination with other planning documents and processes. The guidelines also describe the transportation modeling process and projecting of future demand for supporting RTP analysis, determining federal air quality conformity, and SB 375 Sustainable Communities Strategy (SCS) development, as well as the key assumptions typical of transportation demand models. Additionally, the guidelines describe the consultation and coordination process, which is designed to foster involvement by all interested parties and key stakeholders, discuss the environmental considerations of an RTP, list the general contents of an RTP document, and provide an overview of federal and State requirements and recommendations for performance management applications in the RTP (Caltrans 2017).

Senate Bill 375

SB 375 (Chapter 728, Statutes of 2008) requires California's MPOs to prepare an SCS that demonstrates how the region will meet regional GHG reduction targets through integrated land use, housing, and transportation planning. In 2010, the California Air Resources Board (CARB) established per capita regional GHG reduction targets for passenger vehicles to be met by 2020 and 2035. These targets were updated in 2018. For the San Diego region the updated targets are 15 percent below 2005 levels in 2020 and 19 percent below 2005 levels in 2035.

The SCS is incorporated into the MPO's RTP. CARB must review the SCS to determine if it would enable the MPO to meet regional GHG reduction targets once implemented.

Assembly Bill 441

AB 441 (Government Code Section 14522.3), signed by Governor Brown on September 19, 2012, requires the CTC to attach a summary of the policies, practices, or projects promoting health and health equity employed by MPOs in their RTPs into the commission's next update to its RTP guidelines. AB 441 is intended to allow sharing of innovative transportation plans, strategies, and goals that can serve as models for cities, counties, and the State in transportation planning and development to promote the health and well-being of all residents.

Assembly Bill 1358 – California Complete Streets Act

AB 1358, the Complete Streets Act (Government Code Sections 65040.2 and 65302), was signed into law in September 2008. As of January 1, 2011, the law required cities and counties, when updating the part of a local general plan that addresses roadways and traffic flows, to ensure that those plans account for the needs of all roadway users. Specifically, the legislation requires cities and counties to ensure that local roads and streets adequately accommodate the needs of bicyclists, pedestrians, and transit riders, as well as motorists.

California Bicycle Transportation Act

The California Bicycle Transportation Act was enacted in 1994 to establish a bicycle transportation system that is designed and developed to achieve the functional commuting needs of employees, students, businesspersons, and shoppers. The bicycle transportation system should take into consideration route selection, the physical safety of the bicyclist and their property as a major planning component, and the capacity to accommodate bicyclists of all ages and skills. As defined in the California Bicycle Transportation Act, bikeways are categorized as Class I, Class II, Class III, or Class IV facilities. Additionally, the California Bicycle Transportation Act requires Caltrans, in cooperation with county and city governments, to establish minimum safety design criteria for each bikeway classification and roadways where bicycle travel is permitted, and also requires Caltrans to establish uniform specifications and symbols for signs, markers, and traffic control devices to designate bikeways, regulate traffic, improve safety and convenience for bicyclists, and alert pedestrians and motorists of the presence of bicyclists. Furthermore, the Act requires all cities and counties to have an adopted bicycle master plan to apply for Bicycle Transportation Account funding.

Senate Bill 743

SB 743 (Steinberg) was signed into law by Governor Jerry Brown on September 27, 2013, and encourages development of mixed-use, transit-oriented infill projects by: (1) establishing new CEQA exemptions for transit-oriented developments located in Transit Priority Areas (TPAs) that are consistent with an adopted Specific Plan; (2) eliminating the requirement to evaluate aesthetic and parking impacts in those targeted development areas; and (3) directing the California Office of Planning and Research (OPR) to develop an alternative metric to evaluate transportation-related impacts under CEQA.

SB 743 exempts from CEQA, a residential, employment center, or mixed-use development project, including any subdivision, or any zoning, change that meets all of the following criteria:

1. The project is proposed within a TPA.[6]
2. The project is undertaken to implement and is consistent with a specific plan for which an environmental impact report has been certified.
3. The project is consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy accepted by CARB.

Furthermore, "[a]esthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area shall not be considered significant impacts on the environment." However, the exemption for aesthetic impacts does not include impacts on historic or cultural resources. Local governments retain their ability to regulate a project's transportation, aesthetics, and parking impacts outside of the CEQA process pursuant to local design review ordinances or other discretionary powers.

For infill development, including transit-oriented development, SB 743 provides a rationale for the development of a new metric to evaluate CEQA transportation impacts. Prior to SB 743, CEQA transportation impacts were primarily assessed (at least at the project level) through Level of Service (LOS) and other congestion or delay-based analyses, which focused exclusively on motor vehicle delay. This often penalizes infill and active transportation projects. SB 743 establishes that the new transportation impact analysis methodology should appropriately balance the needs of congestion management with statewide goals related to transit-oriented mixed-use infill development, promotion of public health through active transportation, and reduction of GHG emissions.

SB 743 also directed OPR to identify appropriate criteria for the evaluation of transportation impacts in CEQA Guidelines amendments, and provided that once these amendments are adopted, automobile delay, as measured by "level of service" and other similar metrics, no longer constitutes a significant environmental effect under CEQA. OPR selected VMT as the preferred transportation impact metric and applied its discretion to require its use statewide for land use projects and to recommend its use for transportation projects. The revised CEQA Guidelines that implement SB 743 became effective on December 28, 2018, and indicate in CEQA Guidelines Section 15064.3 that VMT is the basis for evaluation of transportation impacts for land use projects. The revised guidelines state that, except as provided in Section 15064.3(b)(2) for roadway capacity projects, a project's "effect on automobile delay shall not constitute a significant environmental impact," although automobile delay may still be appropriate for evaluation of projects as part of the planning process. For roadway capacity projects, the CEQA Guidelines specify that agencies have discretion to determine the appropriate measure of transportation impacts consistent with CEQA and other applicable requirements.

In December 2018 OPR issued a Technical Advisory on implementing SB 743 requirements, including recommendations for VMT thresholds of significance for certain types of land use projects (OPR 2018). Also,

[6] A TPA is an area that is located within one-half mile of an existing or planned major transit stop. A "major transit stop" refers to a site containing an existing rail or bus rapid transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. To qualify as a TPA, a planned major transit stop needs to be scheduled for completion within the planning horizon included in the adopted Regional Transportation Improvement Program (RTIP).

Caltrans has issued guidance on how to evaluate VMT impacts of land use projects affecting the state highway system and state highway system transportation projects (Caltrans 2020a).

Public Resources Code Section 30253

Public Resources Code Section 30253, Part 4, establishes a policy that development within the Coastal Zone must minimize energy consumption and VMT.

Assembly Bill 1730 of 2019

AB 1730 of 2019 requires the updated RTP, SCS, and EIR adopted by SANDAG on October 9, 2015, to remain in effect for State compliance, funding eligibility, and other purposes until December 31, 2021, when SANDAG must adopt its next update to its regional transportation plan. The bill provides that an interim update to the 2015 RTP adopted by SANDAG for purposes of compliance with certain federal laws (i.e., the 2019 Federal RTP) shall not constitute a project for the purposes of CEQA, thereby exempting it from CEQA. The bill also requires SANDAG to submit an implementation report to CARB when it submits an SCS for review.

Assembly Bill 2731

AB 2731 of 2020 authorizes SANDAG to obtain site control to support the redevelopment of the Old Town Center site, including a transit and transportation facilities project, in the City of San Diego before completing the environmental review for those actions. Requirements of CEQA for transit-oriented development projects occurring at the Old Town Center site that meet certain requirements are satisfied by a specific environmental impact statement prepared by the United States Department of the Navy. Further environmental review for transit-oriented development projects is to be conducted only if certain events occur.

California Highway Design Manual

The *California Highway Design Manual* (HDM) is published by Caltrans and establishes uniform policies, procedures, and standards to carry out the freeway and state highway design functions within the state (Caltrans 2020b). The HDM also provides guidance, policies, and standards for the design of bicycle facilities.

California Manual on Uniform Traffic Control Devices

The *California Manual on Uniform Traffic Control Devices* (California MUTCD) is published by the State of California/Caltrans and is issued to adopt uniform standards and specifications for all official traffic control devices in California, in accordance with Section 21400 of the California Vehicle Code (Caltrans 2020c). The California MUTCD incorporates the U.S. Federal Highway Administration's *Manual on Uniform Traffic Control Devices* and incorporates all policies on traffic control devices issued by Caltrans.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

TransNet Extension Ordinance and Expenditure Plan

In 2008, 67 percent of San Diego County voters approved the TransNet Extension Ordinance and Expenditure Plan (Commission Ordinance 04-01) to extend to 2048 the half-cent sales tax for regionwide transportation improvements originally approved in 1987 (Commission Ordinance 87-1). The revenues must be used solely for the improvements identified in the Expenditure Plan for the extension ordinance. SANDAG allocates the revenues in its capacity as the San Diego County Regional Transportation Commission.

The Expenditure Plan identifies capital improvements for highways (managed lane/high-occupancy vehicle [HOV] lanes and general purpose lanes), capital improvements and operations and maintenance support for rail transit and bus rapid transit, local bus and senior and disabled transportation services, local streets and roads, bicycle and pedestrian facilities, transportation-related community infrastructure to support smart growth development, environmental mitigation and enhancement projects, and administrative expenses including an Independent Taxpayer Oversight Committee. When allocating revenues, the extension ordinance requires that SANDAG "shall make every effort to maximize State and federal transportation funding to the region" (Section 5(C)). Projects receiving TransNet funds are required to accommodate travel by pedestrians and bicyclists in accordance with the best available standards and guidelines (Section 4(E)(3)).

Section 16 of the extension ordinance describes the process for amending the Expenditure Plan. Amendments to the Environmental Mitigation Program (Section 2(D)) and projects included in the Expenditure Plan for the original ordinance in 1987 that remain uncompleted (e.g., State Route 76 East Segment and the Mid-Coast Corridor Transit Project) require approval by the voters of San Diego County. Other provisions requiring voter approval to be amended relate to imposition of the half-cent sales tax (Section 3), maintenance of effort requirements for local revenues (Section 8), the regional transportation congestion improvement program (Section 9), and the Independent Taxpayer Oversight Committee (Section 11). Other provisions may be amended by a two-thirds vote of the SANDAG Board of Directors. Section 5 of the extension ordinance provides that the Expenditure Plan must be amended as necessary to maintain consistency with the RTP.

Designing for Transit

The Design for Transit – A Manual for Integrating Public Transportation and Land Development in the San Diego Metropolitan Area is published by MTS (2018). The manual is designed to help planners, developers, architects, and engineers understand the physical requirements of public transportation. The manual provides specific design standards for public transportation facilities including bus and light rail transit within the San Diego region. The manual also recommends measures that can improve transit service and enhance safe access to transit on local streets through Complete Streets design strategies.

General Plan Circulation Elements

As mandated by State law, general plans must have a circulation element (sometimes referred to as a transportation or mobility element) that is consistent with all other elements of the general plan (Government Code Section 65302). Circulation elements describe the individual jurisdictions' transportation system, including roadways as well as public transit, pedestrian, and bicycle facilities, and outline goals and policies. Circulation elements and their compatibility with land use plans are an important part of overall regional transportation planning, as each general plan works to harmonize local land uses and development patterns with transportation goals and needs. The planning horizon for local general plans is often between 15 and 20 years. In the San Diego region, there are 19 general plans prepared by individual jurisdictions.

San Diego Forward

San Diego Forward is the long-range transportation plan for the San Diego region. On October 9, 2015, SANDAG adopted *San Diego Forward: The Regional Plan* (2015 Regional Plan), which integrated both the 2004 Regional Comprehensive Plan and the 2050 RTP/SCS adopted in 2011 into one unified plan. In 2019, AB 1730 provided a 2-year extension for updating the 2015 Regional Plan to comply with State requirements; while work progressed on the proposed Plan, SANDAG adopted the 2019 Federal Regional Transportation Plan (2019 Federal RTP) on October 25, 2019, to comply with federal requirements for the development of regional

transportation plans, retain air quality conformity approval from the U.S. Department of Transportation, and preserve funding for the region's transportation investments. The 2019 Federal RTP updated project costs and revenues and the regional growth forecasted from the 2015 Regional Plan. The 2019 Federal RTP provides a roadmap for the San Diego region to grow and evolve. Additionally, it prioritizes $208 billion in regional transportation projects over 30 years to create a framework for much of the region's transportation infrastructure (SANDAG 2019). The 2019 Federal RTP addresses many important issues, including: using land more wisely, building an efficient and more accessible transportation system, protecting the environment, improving public health, promoting a strong regional economy, better managing access to energy, incorporating equity into our transportation investments, addressing pressing needs on tribal lands, and supporting a vibrant international border.

As the long-range transportation plan for the region, *San Diego Forward* plans and identifies funding for the transit, freeway/state highway, and regional arterial system networks within the San Diego region. Additionally, while planning pedestrian and bicycle networks is generally done by the individual jurisdictions, *San Diego Forward* provides an overall framework for these networks, establishes regional networks that cross multiple jurisdictions, and sets aside grant funding to assist with the implementation of bicycle and pedestrian facilities within the local jurisdictions.

The following key policies that address the circulation system are included in both the 2015 Regional Plan and the 2019 Federal RTP:

- Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages.
- Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living.
- Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people, live and play.
- Take advantage of new technologies to make the transportation system more efficient and accessible.
- Connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.

Regional Transportation Improvement Program

The Regional Transportation Improvement Program (RTIP) is a 5-year program of major transportation projects funded by federal, State, *TransNet* local sales tax, and other local and private funding and also includes proposed local streets and roads projects. The 2021 RTIP, adopted by the SANDAG Board of Directors on February 26, 2021, covers fiscal years 2021 through 2025, and incrementally implements the 2019 Federal RTP. In developing the 2021 RTIP, SANDAG consulted with local jurisdictions through public meetings of the various SANDAG committees and working groups that are responsible for the development and oversight of the projects. These committees include the Transportation Committee, the Cities/County Transportation Advisory Committee, the Social Equity Working Group, the Interagency Technical Working Group on Tribal Transportation Issues, the Independent Taxpayer Oversight Committee, and the San Diego Region Conformity Working Group (SANDAG 2021c).

Riding to 2050 – San Diego Regional Bike Plan

Riding to 2050 – San Diego Regional Bicycle Plan (Riding to 2050) establishes the plan for the regional bicycle system within the San Diego region and was adopted by the SANDAG Board or Directors in April 2010. The plan is intended to guide the development of the regional bicycle system through the year 2050. Riding to 2050 outlines a range of recommendations to facilitate accomplishing the following regional goals:

- Increase the number of people who bike and frequency of bicycle trips for all purposes.
- Encourage the development of Complete Streets.
- Improve safety for bicyclists.
- Increase public awareness and support for bicycling in the San Diego region.

Riding to 2050 includes recommendations for bicycle infrastructure improvements, bicycle related programs, implementation strategies, and policy and design guidelines (SANDAG 2010b).

Riding to 2050 presents an interconnected network of bicycle corridors that would enable residents to bicycle with greater safety, directness, and convenience within and between major regional destinations and activity centers. While bicycle planning and policy-making is primarily focused on the local level, Riding to 2050 provided an opportunity to improve regional coordination and connectivity of bicycle facilities between jurisdictions. The network selection and classification process included on-going consultation with the SANDAG Bicycle-Pedestrian Working Group, which was composed of staff from each of the 19 local jurisdictions. (SANDAG 2010b.)

On September 27, 2013, the SANDAG Board of Directors approved the Regional Bike Plan Early Action Program (Bike Plan EAP) – a $200 million initiative to expand the Regional Bike Network regionwide and finish high-priority projects within a decade. The adopted Bike Plan EAP comprises 38 projects, totaling roughly 77 miles of new bikeways that will make it much easier for people to ride their bikes to school, work, transit stations, and other major destinations. The Bike Plan EAP is funded by TransNet, the regional half-cent sales tax for transportation approved by San Diego County voters. TransNet funding will be leveraged to bring in State and federal dollars so that the region can complete more bike projects and reap even greater economic, health, and mobility benefits.

Both Riding to 2050 and the Bike Plan EAP were incorporated in the 2015 Regional Plan and the 2019 Federal RTP.

4.16.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the CEQA Guidelines Appendix G checklist questions. Checklist questions for transportation are provided in Section XVII of CEQA Guidelines Appendix G. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document to develop significance criteria that reflect the programmatic level of analysis in this EIR, and the unique characteristics of the proposed Plan. Notably, Appendix G, Section XVII, question (d) regarding whether the proposed Plan would result in inadequate emergency access is addressed under HAZ-4 in Section 4.9.

For purposes of this EIR, implementation of the proposed Plan would have a significant transportation impact if it would:

TRA-1	Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.
TRA-2	Conflict or be inconsistent with CEQA Guidelines Section 15064.3 by not achieving the substantial VMT reductions needed to help achieve statewide GHG reduction goals.
TRA-3	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses.
TRA-4	Lead to a lack of parking supply that would cause significant secondary environmental impacts not already analyzed in other resource chapters of this EIR.

4.16.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

TRA-1 CONFLICT WITH A PROGRAM, PLAN, ORDINANCE, OR POLICY ADDRESSING THE CIRCULATION SYSTEM, INCLUDING TRANSIT, ROADWAY, BICYCLE, AND PEDESTRIAN FACILITIES

ANALYSIS METHODOLOGY

The emphasis of the analysis is on plan inconsistency and conflicts between the proposed Plan's transportation network improvements and programs, and existing applicable regional programs, plans, ordinances, or policies addressing the circulation system and on whether any inconsistencies would result in significant environmental effects compared to existing conditions. The proposed Plan is considered consistent with the provisions of the identified regional plans if it meets the general intent of the applicable plans. The regulatory setting provides a brief overview of the relevant regional planning documents and their primary goals. However, the proposed Plan consistency conclusions are based upon the planning documents as a whole.

Because the proposed Plan identifies and proposes transportation network improvements at a regional level, plan consistency was reviewed against other regional plans and policies. Because of the close relationship among forecasted regional growth and land use change and planned transportation network improvements and programs on travel behavior, this section analyzes their combined effect, instead of separate analyses for regional growth and land use change and transportation network improvements and programs.

SB 375 requires RTPs to use "the most recent planning assumptions considering local general plans and other factors." Therefore, it can be assumed the proposed Plan would generally be consistent with transportation programs, plans, ordinances, and policies of the individual jurisdictions in the region.

This analysis reviews the proposed Plan against the 2019 Federal RTP and Riding to 2050 plans, presented in additional detail in Section 4.16.2, *Regulatory Setting,* to determine if there are any conflicts. Both plans were developed with and reflect extensive local jurisdiction planning input. Rather than the 2015 Regional Plan, this analysis used the 2019 Federal RTP because it contains more recent planning assumptions for project costs, revenue, and forecasted regional growth.

To determine if the proposed Plan is consistent with the programs, plans, policies, and ordinances contained in the current regional planning documents, the infrastructure and demand for each mode (transit, vehicular, pedestrian, and bicycle) were compared to Baseline Year 2016 conditions. If the proposed Plan is shown to be

consistent with the policies contained in the 2019 Federal RTP and Riding to 2050, it is assumed to be consistent with the current planning documents and have a less-than-significant impact.

The impact analysis considers consistency of the proposed Plan's transportation network improvements and programs, but not the proposed Plan's regional growth and land use change, with the transportation content of the 2019 Federal RTP and Riding to 2050. This approach is taken because the Impact TRA-1 significance criterion is limited to "circulation system "(i.e., transportation) issues.

Please note that the information presented in Tables 4.16-5 through 4.16-16 has been updated in the Final EIR. These updates are primarily due to minor modifications in the transportation network improvements included within the proposed Plan, as noted in Appendix B. Additionally, minor corrections to the ABM2+ were also made, which are detailed in Appendix S of the proposed Plan (page S-104).

IMPACT ANALYSIS

2025

Transportation Network Improvements and Programs

Tables 4.16-5 through 4.16-8 outline the transportation network improvements and demand, by mode, under the proposed Plan in Year 2025 compared to Baseline Year 2016 conditions. A list of the specific transportation network improvements included within the proposed Plan under 2025 conditions is provided in Appendix B of this EIR.

Transit

Table 4.16-5
Transit System Analysis – Year 2025

Category	Baseline Year 2016	Year 2025 Proposed Plan	Change from Baseline Year 2016
Miles of Transit Service[1]	~~94,434~~94,410	~~133,638~~146,926	~~39,204~~52,516
Commuter Rail	930	1,717	787
Light Rail Transit	10,344	13,335	2,991
Rapid	9,908	29,776~~29,889~~	19,868~~19,981~~
Bus	73,228~~52~~	102,097~~102,243~~	28,869~~28,991~~
Average Daily Transit Trips	~~254,526~~257,891	~~415,643~~416,061	~~161,117~~158,170
Transit Mode ~~Share[1]~~Share[2]	1.7%	~~2.6%~~2.7%	~~0.9%~~1.0%
Average Length of Transit Trip (miles)	9.01~~9.08~~	9.57~~9.53~~	0.56~~0.45~~

~~Source~~ : ABM2+

[1] SANDAG maintains existing and future planned transit routes in coverage using geographic information system software ArcInfo. Daily Miles of Transit Service is the sum of all transit routes' length multiplied by the daily number of trips each route makes.

[1~~2~~] Mo~~r~~de share includes all trip types for San Diego residents.

Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

As shown in Table 4.16-5, the proposed Plan would increase the miles of transit service within the region by more than ~~25~~ 55 percent compared to Baseline Year 2016 conditions. The additional transit services included

in the proposed Plan would increase transit ridership by more than ~~a third~~60 percent and increase the average transit trip length by 0.56~~0.45~~ mile, as projected by the ABM2+. As such, the transit infrastructure and programs included in the proposed Plan, under Year 2025 conditions, would expand the multi-modal network within the region and provide more convenient travel choices between where people live, work, and play. The transit improvements in the proposed Plan would further the policy goals of the 2019 Federal RTP and therefore would not conflict with them:

- *Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages.* The proposed expansion of the region's transit network would provide more connections to a variety of job centers around the region.
- *Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living.* The proposed expansion of the region's transit network would also provide more viable multi-modal options for travelers, resulting in reductions in both VMT per capita and VMT per employee within the region, thus reducing GHG emissions, creating a cleaner and more sustainable environment.
- *Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people, live, and play.* Both the population and employment within a half mile of a major transit stop would increase substantially with the implementation of the proposed Plan (see Table 4.16-17 under Impact TRA-2). As such, the proposed Plan would improve the number of safe, secure, healthy, affordable, and convenient travel choices between the places where people, live, and play.
- *Take advantage of new technologies to make the transportation system more efficient and accessible.* The proposed Plan includes the implementation of several state-of-the-art transit facilities and programs that are designed to further expand the region's transit system with minimal impact on the public right-of-way. Additionally, the proposed Plan looks to leverage technology to deploy and manage transit services within the region, to both reduce costs and improve service for all users.

Roadway

Table 4.16-6
Roadway Network Analysis – Year 2025

Category	Baseline Year 2016	Year 2025 Proposed Plan	Change from Baseline Year 2016
Lane Miles of Roadway	6,922	~~7,168~~7,115	~~245~~233
Total Freeways (includes auxiliary lanes)	2,576	2,643~~2,648~~	~~72~~67
General Purpose Lanes	2,415	2,438	23
HOV/Managed Lanes	116	150~~155~~	~~39~~34
Tollway	45	55	10
State Highways	628	643~~655~~	~~27~~15
Arterials	3,718	3,869~~3,864~~	~~146~~150
Average Daily Vehicular Trips	~~13,107,396~~12,938,524	13,074,829~~13,229,674~~	~~122,278~~136,305
HOV Trips	~~6,726,856~~6,647,247	6,861,984~~6,937,455~~	~~210,599~~214,737

Category	Baseline Year 2016	Year 2025 Proposed Plan	Change from Baseline Year 2016
Vehicular Mode Share[1]	~~87.4%~~87.3%	83.9%~~84.1%~~	-3.4%~~-3.3%~~
Average Length of Vehicular Trip (miles)	~~6.97~~6.87	6.71~~6.79~~	~~-0.18~~-0.16

Source: ABM2+
Auxiliary lane = extra lane constructed between on- and off-ramps that allows drivers a safe way to merge into traffic while also preventing bottlenecks caused by drivers attempting to enter or exit the freeway.
1. Mo~~r~~de share includes all vehicle classifications and all trip types for San Diego residents.
Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

As shown in Table 4.16-6, the proposed Plan would slightly increase the total number of roadway lane miles within the region (3.4 percent) under Year 2025 conditions compared to Baseline Year 2016 conditions. However, the largest share of proposed transportation network improvement investments are managed lanes, which offer priority access to people using transit, carpooling, or vanpooling along with emergency vehicles and low-emission vehicles with appropriate decals. When combined with proposed transportation network improvements across all modes of travel, the vehicular mode share within the region would decrease by ~~3.3~~3.4 percentage points, and the average trip length would decrease by ~~0.18~~0.16 mile, as projected by ABM2+. The roadway improvements in the proposed Plan would further the policy goals of the 2019 Federal RTP:

- *Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living.* The associated decreases in average vehicular trip length noted above would result in a lower average VMT per capita and VMT per employee within the region (see Table 4.16-17. These decreases in vehicular traffic would result in lower GHG emissions, creating a cleaner and more sustainable environment.
- *Take advantage of new technologies to make the transportation system more efficient and accessible.* The proposed Plan includes the implementation of several state-of-the-art traffic control and response systems (ATDM/SIS) that are designed to improve traffic flow, integrate and connect multiple modes of travel, as well as better manage congestion and incidents within the region's roadway network.

Therefore, these improvements are consistent with the policies outlined in the 2019 Federal RTP and would not conflict with them.

Bicycle

Table 4.16-7
Bicycle Network Analysis – Year 2025

Category	Baseline Year 2016	Year 2025 Proposed Plan	Change from Baseline Year 2016
Lane Miles of Bicycle Facilities[1]	3,112.1~~1,574~~	3,345.4~~1,672~~	233.2~~98~~
Class I	359.5~~166~~	380.5~~190~~	21.0~~24~~
Class II	2,101.0~~1,039~~	2,151.1~~1,076~~	50.1~~37~~
Class III	642.3~~349~~	712.3~~356~~	70.0~~7~~
Class IV	9.3~~20~~	74.6~~37~~	65.3~~17~~
Bike Boulevard	0.0~~0~~	26.9~~13~~	26.9~~13~~

Category	Baseline Year 2016	Year 2025 Proposed Plan	Change from Baseline Year 2016
Average Daily Bicycle Trips	~~109,623~~113,171	174,335	~~64,712~~58,865
Bicycle Mode Share[1]	0.8%~~0.7%~~	1.1%	~~0.4%~~0.3%
Average Length of Bicycle Trip (miles)	~~2.76~~2.85	~~3.03~~3.39	~~0.27~~0.54

Source: ABM2+

[1] Reporting of bicycle facilities was converted from total centerline miles (provided in the Draft EIR) to total lane miles, based on public comments.

~~1~~[2] Mo~~r~~de share includes all trip types for San Diego residents.

Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

~~A~~As shown in Table 4.16-7, the 2021 Regional Plan would implement ~~98~~233.2 lane miles of new bicycle facilities under Year 2025 conditions, and would also increase the average number of daily bicycle trips by ~~nearly 60~~over 50 percent over base year conditions, as projected by ABM2+. The bicycle improvements in the proposed Plan would further the policy goals of the 2019 Federal RTP. As such, the proposed Plan is consistent with the following policies outlined in the 2019 Federal RTP:

- *Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages*. Expanding the region's bike network would create new safe and reliable bicycle connections between residential neighborhoods and job centers within the region, providing additional travel options for residents.
- *Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living*. The proposed increase in bicycle facilities within the region would incentivize more travelers to ride a bike, as reflected in the increase in bicycle mode share with the implementation of the proposed Plan. The increase in bicycle mode share would help (in association with the other proposed improvements) to lower the average VMT per capita and VMT per employee within the region (see Table 4.16-17). These decreases in vehicular traffic would result in lower GHG emissions, creating a cleaner and more sustainable environment.
- *Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people, live, and play*. Cycling is one of the most healthy and affordable modes of transportation; thus, expanding the region's bicycle network would create more convenient, safe, and reliable connections between residential neighborhoods, job centers, and places of recreation.
- *Connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.* As noted previously, cycling is one of the healthiest modes of transportation; thus, expanding the region's bicycle network would create more convenient, safe, and reliable connections between residential neighborhoods, job centers, and places of recreation. These new connections would promote and incentivize more travelers to choose to ride a bike to their destination over the other modes of travel, as indicated by the projected increase in bicycle mode share.

The proposed Plan is also consistent with the following goals from Riding to 2050:

- *Increase the number of people who bike and frequency of bicycle trips for all purposes.* As shown in Table 4.16-7, implementation of the proposed Plan would increase bicycle ridership within the region by ~~64,712~~58,865 daily trips, under Year 2025 conditions.
- *Improve safety for bicyclists.* As shown in Table 4.16-7, the proposed Plan would increase the total number of protected and separated bicycle facilities within the region (Class I, Class II, and Class IV facilities). These

facilities provide cyclists their own right-of-way within the roadway and reduce the number of conflicts with vehicular traffic, resulting in safer conditions.

Therefore, the proposed Plan bicycle improvements do not conflict with the policies outlined in the 2019 Federal RTP and Riding to 2050.

Pedestrian

Table 4.16-8
Pedestrian Analysis – Year 2025

Category	Baseline Year 2016	Year 2025 Proposed Plan	Change from Baseline Year 2016
Average Daily Walking Trips	~~1,171,853~~1,175,429	1,494,939~~1,472,294~~	~~300,441~~319,510
Walking Mode Share[1]	~~7.8%~~7.9%	9.6%~~9.4%~~	~~1.60%~~1.7%
Average Length of Walking Trip (miles)	0.82~~0.81~~	~~0.80~~0.81	-0.01

Source: ABM2+
[1] Mo~~r~~de share includes all trip types for San Diego residents.

The proposed Plan does not include any direct or specific pedestrian facility expansions or improvements; however, the programs and policies contained within the proposed Plan would incentivize travelers to walk more as well as improve walking conditions within the region. Those programs include Vision Zero, TDM, Complete Streets in Mobility Hubs, and land use and housing programs that concentrate housing closer to destinations. As such, with the implementation of the proposed Plan, under Year 2025 conditions, the number of pedestrian trips generated within the region would increase by more than 25 percent over 2016 conditions as projected by ABM2+. This is consistent with the policies outlined in the 2019 Federal RTP as it shows that the proposed Plan would better connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.

2025 Conclusion

Under Year 2025 conditions, the proposed Plan would implement approximately ~~98~~ 233.2 additional lane miles of bicycle facilities, and ~~almost 40,000~~over 50,000 additional miles of transit service within the region. The proposed Plan would also increase the number of bicycle, pedestrian, and transit trips generated within the region, while reducing the vehicular mode share from ~~87.4 to 84.1~~87.3 to 83.9 percent, as compared to Baseline Year 2016 conditions. These characteristics of the proposed Plan further the policies outlined in the 2019 Federal RTP and Riding to 2050 and would not conflict with them. Therefore, implementation of the proposed Plan, under Year 2025 conditions, would result in a less-than-significant impact.

2035

Transportation Network Improvements and Programs

Tables 4.16-9 through 4.16-12 outline the transportation network improvements and demand, by mode, under the proposed Plan in Year 2035 compared to Baseline Year 2016 conditions. A list of the specific transportation network improvements included within the proposed Plan under 2035 conditions is provided in Appendix B of this EIR.

Transit

Table 4.16-9
Transit System Analysis – Year 2035

Category	Baseline Year 2016	Year 2035 Proposed Plan	Change from Baseline Year 2016
Miles of Transit Service[1]	~~94,434~~94,410	242,746~~244,663~~	~~150,229~~148,336
Commuter Rail	930	6,062	5,132
Light Rail Transit	10,344	25,000	14,656
Rapid	9,908	~~93,601~~90,721	80,813~~83,693~~
Bus	~~73,252~~73,228	~~120,000~~120,963	47,735~~46,748~~
Average Daily Transit Trips	~~254,526~~257,891	~~778,888~~805,642	~~524,362~~547,751
Transit Mode ~~Share[1]~~Share[2]	1.7%	5.0%~~4.8%~~	~~3.1%~~3.3%
Average Length of Transit Trip (miles)	9.01~~9.08~~	~~9.65~~9.74	~~0.57~~0.73

Source: ABM2+
[1] SANDAG maintains existing and future planned transit routes in coverage using geographic information system software ArcInfo. Daily Miles of Transit Service is the sum of all transit routes' length multiplied by the daily number of trips each route makes.
[1~~2~~]Mo~~r~~de share includes all trip types for San Diego residents.
Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

As shown in Table 4.16-9, the proposed Plan would increase the miles of transit service within the region by more than 2.5 times the current mileage, as compared to Baseline Year 2016 conditions. The additional service would double the current transit ridership and increase the average transit trip length by ~~0.57~~0.73 mile, as projected by ABM2+. As such, the transit infrastructure and programs included in the proposed Plan, under Year 2035 conditions, would expand the multi-modal network within the region and provide more convenient travel choices between where people live, work, and play. The transit improvements would further the following policies outlined in the 2019 Federal RTP and would not conflict with them.

- *Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages.* The proposed expansion of the region's transit network would provide more connections to a variety of job centers around the region.
- *Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living*. The proposed expansion of the region's transit network would also provide more viable multi-modal options for travelers, resulting in reductions in both VMT per capita and VMT per employee within the region, thus reducing GHG emissions, creating a cleaner and more sustainable environment.
- *Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people, live, and play.* As shown in Table 4.16-18 both the population and employment within a half mile of a major transit stop would increase substantially with the implementation of the proposed Plan. As such, the proposed Plan would improve the number of safe, secure, healthy, affordable, and convenient travel choices between the places where people live, work, and play.
- *Take advantage of new technologies to make the transportation system more efficient and accessible.* The proposed Plan includes the implementation of several state-of-the-art transit facilities and programs that are designed to further expand the region's transit system while having minimal impact on the public right-

of-way. Additionally, the proposed Plan looks to leverage technology to deploy and manage transit services, within the region, to both reduce costs and improve service for all users.

Roadway

Table 4.16-10
Roadway Network Analysis – Year 2035

Category	Baseline Year 2016	Year 2035 Proposed Plan	Change from Baseline Year 2016
Lane Miles of Roadway	6,922	~~7,544~~7,539	~~622~~617
Total Freeways (includes auxiliary lanes)	2,576	~~2,837~~2,844	~~261~~268
General Purpose Lanes	2,415	2,223~~2,230~~	-192~~-185~~
HOV/Managed Lanes	116	565~~552~~	~~436~~449
Tollway	45	55	10
State Highways	628	~~657~~644	~~29~~16
Arterials	3,718	~~4,051~~4,052	~~333~~334
Average Daily Vehicular Trips	~~13,107,396~~12,938,524	~~13,105,098~~12,874,363	~~-2,298~~-64,161
HOV Trips	~~6,726,856~~6,647,247	~~6,760,380~~6,653,854	~~33,524~~6,607
Vehicular Mode Share[1]	~~87.4%~~87.3%	79.5%~~80.0%~~	~~-7.4%~~-7.7%
Average Length of Vehicular Trip (miles)	~~6.97~~6.87	6.63~~6.77~~	~~-0.20~~-0.24

Source: ABM2+
Auxiliary lane = extra lane constructed between on- and off-ramps that allows drivers a safe way to merge into traffic while also preventing bottlenecks caused by drivers attempting to enter or exit the freeway.
[1] Mo~~r~~de share includes all vehicle classifications and trip types for San Diego residents.
Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

As shown in Table 4.16-10, the proposed Plan would ~~slightly~~ increase the total number of roadway lane miles within the region (9.0 percent) under Year 2035 conditions, as compared to Baseline Year 2016 conditions. However, the largest share of proposed transportation network improvement investments are managed lanes, which offer priority access to people using transit, carpooling, or vanpooling along with emergency vehicles and low-emission vehicles with appropriate decals. When combined with proposed transportation network improvements across all modes of travel, the vehicular mode share within the region would decrease by ~~7.4~~7.7 percentage points, and the average trip length would decrease by ~~0.2~~0.24 mile, as projected by the ABM2+. The roadway improvements in the proposed Plan would further the policy goals of the 2019 Federal RTP:

- *Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living*. The associated decreases in average vehicular trip length and travel times noted above would result in a lower average VMT per capita and VMT per employee within the region (see Table 4.16-18). These decreases in vehicular traffic would result in lower GHG emissions, creating a cleaner and more sustainable environment.
- *Take advantage of new technologies to make the transportation system more efficient and accessible.* The proposed Plan includes the implementation of several state-of-the art traffic control and response systems

(ATDM/SIS) that are designed to improve traffic flow, integrate and connect multiple modes of travel, and better manage congestion and incidents within the region's roadway network.

Therefore, these improvements are consistent with the policies outlined in the 2019 Federal RTP and would not conflict with them.

Bicycle

Table 4.16-11
Bicycle Network Analysis – Year 2035

Category	Baseline Year 2016	Year 2035 Proposed Plan	Change from Baseline Year 2016
Lane Miles of Bicycle Facilities[1]	3,112.2~~1,574~~	3,463.7~~1,731~~	351.5~~157~~
Class I	359.5~~166~~	466.3~~233~~	106.8~~67~~
Class II	2,101.0~~1,039~~	2,034.4~~1,017~~	-66.6~~-22~~
Class III	642.3~~349~~	624.2~~312~~	-18.1~~-37~~
Class IV	9.3~~20~~	200.3~~100~~	191.0~~80~~
Bike Boulevards	0.0~~0~~	138.5~~69~~	138.5~~69~~
Average Daily Bicycle Trips	~~109,623~~113,171	~~208,378~~215,216	~~98,755~~102,045
Bicycle Mode ~~Share[1]~~Share[2]	~~0.7%~~0.8%	1.3%	~~0.6%~~0.5%
Average Length of Bicycle Trip (miles)	~~2.76~~2.85	~~3.50~~3.56	~~0.74~~0.71

Source: ABM2+
[1] Reporting of bicycle facilities was converted from total centerline miles (provided in the DEIR) to total lane miles, based on public comments.
[1~~2~~] Mod~~re~~ share includes all trip types for San Diego residents.
Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

As shown in Table 4.16-11, the proposed Plan would implement ~~157~~351.5 lane miles of new bicycle facilities under Year 2035 conditions, as compared to Baseline Year 2016 conditions. As such, the implementation of the proposed Plan would further the following policies outlined in the 2019 Federal RTP:

- *Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages*. Expanding the region's bike network would create new safe and reliable bicycle connections between residential neighborhoods and job centers within the region, providing additional travel options for residents.
- *Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living*. The proposed increase in bicycle facilities within the region would incentivize more travelers to ride a bike, in-lieu of taking a vehicular trip, as reflected in the increase in bicycle mode share with the implementation of the proposed Plan. The increase in bicycle mode share would help (in association with the other proposed improvements) to lower the average VMT per capita and VMT per employee within the region (see Table 4.16-18). These decreases in vehicular traffic would result in lower GHG emissions, creating a cleaner and more sustainable environment.
- *Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people, live, and play*. Cycling is one of the most healthy and affordable modes of transportation; thus, expanding the region's bicycle network would create more convenient, safe, and reliable connections between residential neighborhoods, job centers, and places of recreation.

- *Connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.* As noted previously, cycling is one of the healthiest modes of transportation; thus, expanding the region's bicycle network would create more convenient, safe, and reliable connections between residential neighborhoods, job centers, and places of recreation. These new connections would promote and incentivize more travelers to choose to ride a bike to their destination over the other modes of travel, as indicated by the projected increase in bicycle mode share.

The proposed Plan would also be consistent with the following goals from Riding to 2050:

- *Increase the number of people who bike and frequency of bicycle trips for all purposes.* As shown in Table 4.16-11, implementation of the proposed Plan would increase bicycle ridership within the region by ~~98,755~~102,045 daily trips, under Year 2035 conditions.
- *Improve safety for bicyclists.* As shown in Table 4.16-11, the 2021 Regional Plan would upgrade several miles of unprotected bike facilities, specifically ~~37~~ 18.1 lane miles of Class III Bike Routes and ~~22~~ 66.6 lane miles of Class II Bike lanes, to protected bicycle facilities such as Class I – Multi-Use Pathways and Class IV Cycle Tracks. Upgrading from unprotected to protected facilities would increase the safety for cyclists.

The proposed Plan would also increase the average number of daily bicycle trips by 90 percent over Baseline Year 2016 base year conditions. This is consistent with the Riding to 2050 goal to increase the number of people who bike and the frequency of bicycle trips for all purposes. Therefore, these improvements are consistent with the policies outlined in the 2019 Federal RTP and Riding to 2050 and would not conflict with them.

Pedestrian

Table 4.16-12
Pedestrian Analysis – Year 2035

Category	Baseline Year 2016	Year 2035 Proposed Plan	Change from Baseline Year 2016
Average Daily Walking Trips	~~1,171,853~~1,175,429	~~1,828,393~~1,838,482	~~656,540~~663,053
Walking Mode Share[1]	7.9%~~7.8%~~	~~11.2%~~11.4%	~~3.40%~~3.5%
Average Length of Walking Trip (miles)	~~0.81~~0.82	0.78	~~-0.03~~-0.04

Source: ABM2+
[1] Mo~~r~~de share includes all trip types for San Diego residents.
Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

The 2021 Regional Plan does not include any direct or specific pedestrian facility expansions or improvements; however, the programs and policies contained within the proposed Plan would incentivize travelers to walk more as well as improve walking conditions within the region. Those programs include Vision Zero, TDM, Complete Streets in Mobility Hubs, and land use and housing programs that concentrate housing closer to destinations. Additionally, the expansion of the region's transit network, as displayed in Table 4.16-9, would also increase the number of pedestrian trips, as more people would be inclined to walk to/from transit stations. As such, with the implementation of the proposed Plan, under Year 2035 conditions, the number of pedestrian trips generated within the region would increase by 56 percent over Baseline Year 2016 conditions, as projected by ABM2+. This is consistent with the policies included in the 2019 Federal RTP as it shows that the proposed Plan would better connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.

2035 Conclusion

Under Year 2035 conditions the proposed Plan would implement over ~~157~~ 351.5 additional lane miles of bicycle facilities, and almost 150,000 additional miles of transit service within the region. The proposed Plan would also increase the number of bicycle, pedestrian, and transit trips generated within the region, while reducing the vehicular mode share from ~~87.4~~87.3 percent to ~~80.0~~79.5 percent, compared to Baseline Year 2016 conditions. These characteristics of the proposed Plan are generally consistent with the policies outlined in the 2019 Federal RTP and Riding to 2050 and would not conflict with them. Therefore, implementation of the proposed Plan, under Year 2035 conditions, would result in a less-than-significant impact.

2050

Transportation Network Improvements and Programs

Tables 4.16-13 through 4.16-16 outline the transportation network improvements and demand, by mode, under the proposed Plan in Year 2050 compared to Baseline Year 2016 conditions. A list of the specific transportation network improvements included within the proposed Plan under 2050 conditions is provided in Appendix B of this EIR.

Transit

Table 4.16-13
Transit System Analysis – Year 2050

Category	Baseline Year 2016	Year 2050 Proposed Plan	Change from Baseline Year 2016
Miles of Transit Service[1]	~~94,434~~94,410	~~263,056~~263,005	~~168,622~~168,595
Commuter Rail	930	17,956	17,026
Light Rail Transit	10,344	28,056	17,712
Rapid	9,908	~~95,233~~95,081	~~85,325~~85,173
Bus	~~73,252~~73,228	~~121,810~~121,912	~~48,558~~48,684
Average Daily Transit Trips	~~254,526~~257,891	~~917,830~~944,876	~~663,304~~686,985
Transit Mode ~~Share[1]~~Share[2]	1.7%	~~5.4%~~5.6%	~~3.7%~~3.9%
Average Length of Transit Trip (miles)	~~9.08~~9.01	~~9.74~~9.85	~~0.66~~0.84

Source: ABM2+
[1] SANDAG maintains existing and future planned transit routes in coverage using geographic information system software ArcInfo. Daily Miles of Transit Service is the sum of all transit routes' length multiplied by the daily number of trips each route makes
[1~~2~~] Mo~~r~~de share includes all trip types for San Diego residents.
Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

As shown in Table 4.16-13, the proposed Plan would increase the miles of transit service within the region by nearly 2.8 times the current mileage, as compared to Baseline Year 2016 conditions. The additional service would also almost triple the current transit ridership and increase the average transit trip length by ~~0.66~~0.84 mile, as projected by ABM2+. As such, the transit infrastructure and programs included in the proposed Plan, under Year 2050 conditions, would expand the multi-modal network within the region and provide more convenient travel choices between where people live, work, and play. The transit improvements would further the following policies outlined in the 2019 Federal RTP and would not conflict with them:

- *Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages.* The proposed expansion of the region's transit network would provide more connections to a variety of job centers around the region.
- *Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living*. The proposed expansion of the region's transit network would also provide more viable multi-modal options for travelers, resulting in reductions in both VMT per capita and VMT per employee within the region, thus reducing GHG emissions, creating a cleaner and more sustainable environment.
- *Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people, live, and play.* As shown in Table 4.16-19 both the population and employment within a half mile of a major transit stop would increase substantially with the implementation of the proposed Plan. As such, the proposed Plan would improve the number of safe, secure, healthy, affordable, and convenient travel choices between the places where people, live, and play.
- *Take advantage of new technologies to make the transportation system more efficient and accessible.* The proposed Plan includes the implementation of several state-of-the-art transit facilities and programs that are designed to further expand the region's transit system while having minimal impact on the public right-of-way. Additionally, the proposed Plan looks to leverage technology to deploy and manage transit services within the region to both reduce costs and improve service for all users.

Roadway

Table 4.16-14
Roadway Network Analysis – Year 2050

Category	Baseline Year 2016	Year 2050 Proposed Plan	Change from Baseline Year 2016
Lane Miles of Roadway	6,922	~~7,721~~7,710	~~799~~788
Total Freeways (includes auxiliary lanes)	2,576	2,950	374
General Purpose Lanes	2,415	2,122	-293
HOV/Managed Lanes	116	821	705
Tollway	45	7	-38
State Highways	628	~~660~~648	~~32~~20
Arterials	3,718	~~4,110~~4,112	~~392~~394
Average Daily Vehicular Trips	12,938,524~~13,107,396~~	12,975,633~~13,218,174~~	37,109~~110,778~~
HOV Trips	6,647,247~~6,726,856~~	6,883,015~~6,989,760~~	235,768~~262,904~~
Vehicular Mode Share[1]	87.3%~~87.4%~~	77.1%~~77.6%~~	-10.2%~~-9.8%~~
Average Length of Vehicular Trip (miles)	6.87~~6.97~~	6.67~~6.81~~	-0.20~~-0.16~~

Source: ABM2+
Auxiliary lane = extra lane constructed between on- and off-ramps that allows drivers a safe way to merge into traffic while also preventing bottlenecks caused by drivers attempting to enter or exit the freeway.
[1] Mo~~r~~de share includes all vehicle classifications and trip types for San Diego residents.
Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

As shown in Table 4.16-14, the proposed Plan will ~~would slightly~~ increase the total number of roadway lane miles within the region by 788 miles (~~11.5~~11.4 percent) under Year 2050 conditions, as compared to Baseline Year 2016. However, the largest share of proposed transportation network improvement investments are managed lanes, which offer priority access to people using transit, carpooling, or vanpooling along with emergency vehicles and low-emission vehicles with appropriate decals. When combined with proposed transportation network improvements across all modes of travel, the vehicular mode share within the region would decrease by ~~9.8~~10.2 percentage points, and the average trip length would decrease by ~~0.16~~0.20 mile, as projected by ABM2+. It should be noted, the decrease in tollway milage under the Year 2050 conditions is due to the expiration of the SR 125 tollway franchise agreement, which ends in 2042. After Year 2042, SR 125, south of SR 54, will be reverted to Caltrans control and the tolls will no longer be issued to the public. The roadway improvements in the proposed Plan would further the policy goals of the 2019 Federal RTP:

- *Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living*. The associated decreases in average vehicular trip length and travel times noted above would result in a lower average VMT per capita and VMT per employee within the region (see Table 4.16-19). These decreases in vehicular traffic would result in lower GHG emissions, creating a cleaner and more sustainable environment.
- *Take advantage of new technologies to make the transportation system more efficient and accessible.* The proposed Plan includes the implementation of several state-of-the-art traffic control and response systems (ATDM/SIS) that are designed to improve traffic flow, integrate and connect multiple modes of travel, and better manage congestion and incidents within the region's roadway network.

Therefore, these improvements are consistent with the policies outlined in the 2019 Federal RTP and would not conflict with them.

Bicycle

Table 4.16-15
Bicycle Network Analysis – Year 2050

Category	Baseline Year 2016	Year 2050 with 2021 Regional Plan	Change from Baseline Year 2016
Lane Miles of Bicycle Facilities[1]	3,112.1~~1,574~~	3631.7~~1,816~~	519.6~~242~~
Class I	359.5~~166~~	620.6~~310~~	261.1~~144~~
Class II	2,101.0~~1,039~~	1956.5~~978~~	-144.5~~-61~~
Class III	642.3~~349~~	581.5~~291~~	-60.8~~-58~~
Class IV	9.3~~20~~	297.8~~149~~	288.5~~129~~
Bike Boulevard	0.0~~0~~	175.3~~88~~	175.3~~88~~
Average Daily Bicycle Trips	113,171~~109,623~~	289,930~~270,512~~	176,759~~160,889~~
Bicycle Mode ~~Share[1]~~Share[2]	0.8%~~0.7%~~	1.7%~~1.6%~~	0.9%~~0.9%~~
Average Length of Bicycle Trip (miles)	2.85~~2.76~~	4.10~~3.81~~	1.25~~1.05~~

Source: ABM2+
[1] Reporting of bicycle facilities were converted from total centerline miles (provided in the DEIR) to total lane miles, based on public comments.
~~1~~[2] Mo~~r~~de share includes all trip types for San Diego residents.
Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

As shown in Table 4.16-15, the 2021 Regional Plan would implement ~~242~~ 519.6 lane miles of new bicycle facilities under Year 2050 conditions. As such, the implementation of the proposed Plan would further the following policies outlined in the 2019 Federal RTP:

- *Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages*. Expanding the region's bike network would create new safe and reliable bicycle connections between residential neighborhoods and job centers within the region, providing additional travel options for residents.
- *Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living.* The proposed increase in bicycle facilities within the region would incentivize more travelers to ride a bike, in-lieu of taking a vehicular trip, as reflected in the increase in bicycle mode share with the implementation of the proposed Plan. The increase in bicycle mode share would help (in association with the other proposed improvements) to lower the average VMT per capita and VMT per employee within the region (see Table 4.16-19). These decreases in vehicular traffic would result in lower GHG emissions, creating a cleaner and more sustainable environment.
- *Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people, live, and play*. Cycling is one of the most healthy and affordable modes of transportation; thus, expanding the region's bicycle network would create more convenient, safe, and reliable connections between residential neighborhoods, job centers, and places of recreation.
- *Connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.* As noted previously, cycling is one of the healthiest modes of transportation; thus, expanding the region's bicycle network would create more convenient, safe, and reliable connections between residential neighborhoods, job centers, and places of recreation. These new connections would promote and incentivize more travelers to choose to ride a bike to their destination over the other modes of travel, as indicated by the projected increase in bicycle mode share.

Implementation of the proposed Plan would also be consistent with the following goals from Riding to 2050:

- *Increase the number of people who bike and frequency of bicycle trips for all purposes.* As shown in Table 4.16-15, implementation of the proposed Plan would increase bicycle ridership within the region by ~~160,889~~176,759 daily trips, under Year 2050 conditions.
- *Improve safety for bicyclists.* As shown in Table 4.16-15, the proposed Plan would upgrade several miles of unprotected bike facilities, specifically Class III Bike Routes and Class II Bike lanes, to protected bicycle facilities such as Class I – Multi-Use Pathways and Class IV Cycle Tracks. Upgrading from unprotected to protected facilities would increase the safety for cyclists.

Therefore, these improvements are consistent with the policies outlined in the 2019 Federal RTP and Riding to 2050 and would not conflict with them.

Pedestrian

Table 4.16-16
Pedestrian Analysis – Year 2050

Category	Baseline Year 2016	Year 2050 Proposed Plan	Change from Baseline Year 2016
Average Daily Walking Trips	1,175,429~~1,171,853~~	2,117,553~~2,115,165~~	942,124~~943,312~~
Walking Mode Share[1]	7.9%~~7.8%~~	12.6%~~12.4%~~	4.7%~~4.60%~~
Average Length of Walking Trip (miles)	0.82~~0.81~~	0.79~~0.78~~	-0.03~~-0.03~~

Source: ABM2+
[1] Mod~~r~~e share includes all trip types for San Diego residents.
Note: the revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

The proposed Plan does not include any direct or specific pedestrian facility expansions or improvements; however, the programs and policies contained in the proposed Plan would incentivize travelers to walk more as well as improve walking conditions within the region. Those programs include Vision Zero, TDM, Complete Streets in Mobility Hubs, and land use and housing programs that concentrate housing closer to destinations. Additionally, the expansion of the region's transit network, as displayed in Table 4.16-13, would also increase the number of pedestrian trips, as more people would be inclined to walk to/from transit stations. As such, with implementation of the proposed Plan, under Year 2050 conditions, the number of pedestrian trips generated within the region would increase by 80 percent over Baseline Year 2016 conditions. This is consistent with the policies in the 2019 Federal RTP as it shows that the proposed Plan would better connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.

2050 Conclusion

By 2050 the proposed Plan would implement ~~almost 242~~approximately 519.6 additional lane miles of bicycle facilities and almost 170,000 additional miles of transit service within the region. The proposed Plan would also increase the number of bicycle, pedestrian, and transit trips generated within the region, while reducing the vehicular mode share from ~~87.4~~87.3 percent to ~~77.6~~77.1 percent, as compared to 2016. These characteristics of the proposed Plan are generally consistent with the policies outlined in the 2019 Federal RTP and Riding to 2050 and would not conflict with them. Therefore, implementation of the proposed Plan, under Year 2050 conditions, would result in a less-than-significant impact.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects regarding conflicts with an existing program, plan, ordinance, or policy addressing the circulation system, because climate change would not directly cause such conflicts.

TRA-2 CONFLICT OR BE INCONSISTENT WITH CEQA GUIDELINES SECTION 15064.3 BY NOT ACHIEVING THE SUBSTANTIAL VMT REDUCTIONS NEEDED TO HELP ACHIEVE STATEWIDE GHG REDUCTION GOALS

ANALYSIS METHODOLOGY

Section 15064.3(B) of the CEQA Guidelines criteria for analyzing and determining transportation impacts, states:

> (b) Criteria for Analyzing Transportation Impacts.
>
> (1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be considered to have a less than significant transportation impact.
>
> (2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, a lead agency may tier from that analysis as provided in Section 15152.
>
> (3) Qualitative Analysis. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.
>
> (4) Methodology. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

As noted above, VMT is an appropriate measure to identify transportation-related impacts under CEQA. The specific guidelines provided by CEQA Guidelines Section 15064.3(b)(1) and (2) are intended to be applied at the project level; as such, they are not directly applicable to the program-level transportation network improvements and the regional growth from land use changes that are included in the proposed Plan. However, Section 15064.3(b)(4) does allow for lead agencies to determine the methodology for evaluating VMT, and CEQA Guidelines Section 15064(b) provides lead agencies with discretion to establish a threshold of significance.

In response to the implementation of SB 743 and CEQA Guidelines Section 15064.3(b), the State developed additional guidance on how VMT-related impacts can be evaluated as well as how to establish impact thresholds using the new VMT metric. Key guidance on transportation impacts and VMT is provided by the OPR VMT Technical Advisory (OPR 2018), and a CARB issue paper on VMT reductions to achieve State climate goals (CARB 2019). However, neither document provides guidance or thresholds in regard to assessing the significance of VMT impacts for RTPs at the regional level. The recommendations of both documents are discussed below:

OPR Technical Advisory on Evaluating Transportation Impacts in CEQA, The OPR Technical Advisory provides guidance on determining significance thresholds and assessing VMT. The guidance provided within the Technical Advisory is directed to specific projects by project type (i.e., residential, retail, office, etc.) and local plans (i.e. general plans) and includes recommendations for evaluating transportation impacts. The Technical Advisory utilizes the findings of the 2017 Climate Change Scoping Plan as substantial evidence to establish a VMT threshold for certain land use development projects, stating that:

> In summary, achieving 15 percent lower per capita (residential) or per employee (office) VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the State's emissions goals.

The OPR Technical Advisory does somewhat address VMT-related impacts associated with the development and implementation of General Plans, noting:

> A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office, or retail land uses would in aggregate exceed the respective thresholds recommended above.

However, the Technical Advisory does not provide guidance on the VMT-related impacts that may be associated with regional plans, such as an RTP and SCS, as included in the proposed Regional Plan.

2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals. The Scoping Plan analyzes and documents the statewide VMT estimates and reductions, per capita, that would be required to achieve the State climate goals of 40 percent GHG emissions reduction from 1990 levels by 2030 and 80 percent GHG emissions reduction levels from 1990 by 2050, as established under Executive Order (EO) S-03-05. In the 2017 Climate Change Scoping Plan (CARB 2017) and in a subsequent 2019 analysis (CARB 2019), CARB concluded that MPOs meeting their regional SB 375 targets alone will not achieve the emission reductions necessary to meet State 2035 climate goals; CARB's issue paper (CARB 2019) acknowledges that SB 375 2035 GHG reduction targets, which the proposed Plan exceeds (as discussed under Impact GHG-2 in Section 4.8, *Greenhouse Gas Emissions*), are insufficient to achieve statewide GHG reduction targets and further states that California would need to reduce VMT per capita by 25 percent to achieve necessary Scoping Plan reductions for 2030. The then-adopted SCSs would achieve, in aggregate, only an 18 percent reduction compared to 2005 by 2035. Closing this gap will depend primarily on new State-initiated VMT reduction strategies and local land use and TDM strategies. CARB's 2019 assessment is based on a scenario that CARB developed to achieve the GHG goals through a combination of cleaner vehicles and fuels and slower VMT growth.

Similarly, the 2017 Scoping Plan states that per capita VMT reductions from land use and transportation projects are necessary to achieve the statewide GHG emissions reduction goals but will not alone achieve the goals. To achieve the 2050 statewide goal, CARB (2019) estimates that, for all vehicle types, reductions in total VMT per capita of 14.3 percent below existing levels would be needed.[7] In terms of light-duty vehicle (i.e., passenger vehicle) per capita VMT reductions, to achieve the 2050 statewide goal, CARB (2019) estimates that reductions of 16.8 percent below existing levels would be needed by 2050.[8]

[7] CARB notes that its total VMT is calculated differently than household-generated VMT, and the values are not directly comparable to output from a regional travel demand model.

[8] CARB notes that its light-duty VMT is calculated differently than household-generated VMT, and the values are not directly comparable to output from a regional travel demand model.

VMT Analysis Approach

This EIR's VMT analysis was quantitative, consistent with CEQA Guidelines Section 15064.3. The ABM2+ was utilized to derive the VMT metrics analyzed under each analysis scenario. (It was also used for VMT projections in the Regional Plan.) The ABM2+ is a travel demand forecasting model that incorporates census data and travel surveys to inform the algorithms of the model's projections. It uses a simulated population based on existing and projected demographics, to match residents to employment, and forecasts the daily travel on the regional transportation network. In addition, the model tracks the daily travel of individuals in the simulated population, including origins, destinations, travel distances, and mode choices. This allows the ABM2+ to project transportation metrics such as trip generation, trip assignment, and VMT at both a regional and local level.

The ABM2+ has four forecast scenarios: Baseline Year 2016, which provides a forecast of the year the model inputs (land uses, mobility network, and socio-economic data) are based on, the two interim years 2025 and 2035, and a Horizon Year of 2050. The Year 2025, 2035 and 2050 scenarios are derived based on the planned land uses and mobility improvements within the region, as well as population and employment projections. The different components of the proposed Plan are projected to be implemented over 30 years with a buildout year projected in approximately 2050.

Because of the close relationship among forecasted regional growth and land use change and planned transportation network improvements and programs on travel behavior, this section analyzes their combined effect on per capita and total VMT, instead of separate analyses for regional growth and land use change and transportation network improvements and programs.

Significance Thresholds

VMT per Capita. As noted above, there are no State-recommended significance per capita VMT thresholds for regional plans such as an RTP/SCS. Therefore, a qualitative threshold is used: *would the proposed Plan achieve the substantial VMT reductions needed to help achieve statewide GHG reduction goals*? Also, as noted, to achieve the 2050 statewide goal, CARB (2019) estimates that reductions in total VMT per capita of 14.3 percent below existing levels would be needed by 2050. The VMT per capita reduction target of 14.3 percent under existing levels is utilized in this analysis as a guide to determine whether the proposed Plan would reach the substantial VMT reductions needed to help achieve statewide GHG reduction goals. VMT per capita is calculated based on the total residential-based VMT (Home-Based VMT) generated within the San Diego region divided by the total population of the study area. Home-Based VMT is the VMT that is directly attributed to residents within the region, where either the beginning or end of the trip tour is at a place of residence.

It should be noted that CARB (2019) stresses that the VMT developed in its estimates "is not household-generated VMT, and the values are not directly comparable to the output from a local or regional travel demand model." The ABM2+ derives VMT estimates based on household-generated VMT; as such, the results of the model may not directly align with the results of the CARB issue paper. However, the ABM2+ is currently the best tool within the San Diego region for estimating baseline and future year VMT metrics, including total VMT and VMT per capita; therefore, the ABM2+ was used in the analysis.

Total VMT. Because there are no State-recommended total VMT significance thresholds for regional plans such as an RTP/SCS, a qualitative threshold is used: *would the proposed Plan achieve the substantial VMT reductions needed to help achieve statewide GHG reduction goals?* If the Regional Plan would cause substantial increases in total VMT, then it would not achieve the substantial VMT reductions needed to help achieve statewide GHG reduction goals.

Interim VMT per Capita Targets (for Informational Purposes). As noted above, the State's target reduction of 14.3 percent of the baseline VMT per capita was set for Year 2050 conditions. The State did not establish interim year targets. Therefore, to be conservative, the 14.3 percent target was used for all horizon years to identify VMT impacts. However, for informational purposes, and to further evaluate if the proposed Plan would be on track to meet the State's VMT reduction target by year 2050, interim year VMT reduction targets were estimated for Year 2025 and Year 2035 conditions. The interim year targets were derived based on a straight line interpretation of the full 14.3 percent reduction in VMT per capita and the 34 years (Base Year 2016 to Horizon Year 2050) the region has to achieve that target. As such, the region would need to reduce its VMT per capita at a rate of 0.4 percent per year (14.3 percent ÷ 34 years) over the next 34 years to stay on pace to meet the Year 2050 target of 14.3 percent. The interim VMT per capita targets were not used to determine impact significance.

It should be noted that the qualitative thresholds described above are unique to the proposed Plan, due to its regional and comprehensive nature. These thresholds are not intended for application to other project types, in particular to individual land use projects for which State-recommended per capita VMT thresholds may be appropriate.

Please note that the information presented in Tables 4.16-17 through 4.16-1 has been updated in this Final EIR. These updates are primarily due to minor modifications in the transportation network improvements included within the proposed Plan, as noted in Appendix B. Additionally, minor corrections to the ABM2+ were also made, which are detailed in Appendix S of the proposed Plan (page S-104).

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Table 4.16-17 summarizes the VMT projections and analyses developed under Year 2025 conditions. Total VMT and VMT per capita results are presented and compared between Baseline Year 2016 and Year 2025 under the proposed Plan to identify VMT-related impacts. Additional metrics such as the projected population and employment, VMT per employee, and VMT per service population are also presented.

Table 4.16-17
VMT Analysis – Year 2025

Metric	Baseline Year 2016	Year 2025 Proposed Plan	Difference between Baseline Year 2016 and Year 2025 Proposed Plan	% Change between Baseline Year 2016 and Year 2025 Proposed Plan
Total VMT (daily)[1]	~~84,488,451~~ 83,641,704	~~84,965,647~~ 84,538,406	~~477,196~~ 932,702	~~0.6%~~1.1%
VMT per Capita (miles)[1,2]	~~19.53~~18.94	~~18.12~~17.66	~~-1.41~~-1.28	~~-7.2%~~-6.8%
Home-Based VMT[3]	~~63,769,566~~ 61,848,362	~~62,055,057~~ 60,470,401	~~-1,714,509~~ -1,377,961	~~-2.7%~~-2.2%
Population	3,265,489	3,424,145	158,656	4.9%

Metric	Baseline Year 2016	Year 2025 Proposed Plan	Difference between Baseline Year 2016 and Year 2025 Proposed Plan	% Change between Baseline Year 2016 and Year 2025 Proposed Plan
Employment	1,646,419	1,762,747	116,328	7.1%
VMT per Employee (miles)	~~19.56~~18.91	~~17.46~~16.95	~~-2.10~~-1.96	~~-10.7%~~-10.4%
VMT per Service Population (miles)	~~17.20~~17.02	~~16.38~~16.30	~~-0.82~~-0.72	~~-4.8%~~-4.3%
Population within TPAs	764,847 ~~764,847~~	1,456,876 ~~1,442,054~~	692,029 ~~677,207~~	90.5%~~88.5%~~
Employment within TPAs	609,253 ~~609,253~~	971,340 ~~930,780~~	362,087 ~~321,527~~	59.4%~~52.8%~~
Service Population within TPAs	1,374,100 ~~1,374,100~~	2,428,216 ~~2,372,834~~	1,054,116 ~~998,734~~	76.7%~~72.7%~~

Source: ABM2+

[1] The VMT calculations do not include the off-model VMT reduction in Appendix S of the 2021 Regional Plan because they were not calculated for 2025. Therefore, the VMT figures may be slightly overstated in the analysis. However, these reductions are not anticipated to reduce the impacts to less than significant.

[2] VMT per Capita = Home-Based VMT / Population.

Note: Highlighted rows indicate metrics that are used to evaluate VMT-related impacts.

[3] Home-Based VMT is the total VMT within the region that is generated from trip tours that either start or end at home.

Notes:

- Highlighted rows indicate metrics that are used to evaluate VMT-related impacts.
- The revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

As shown in Table 4.16-17, implementation of the proposed Plan, under Year 2025 conditions, would result in a ~~7.2~~6.8 percent decrease in the region's VMT per capita, as compared to Baseline Year 2016 conditions. This is less than the 14.3 percent reduction CARB estimates will eventually be needed to achieve 2050 State climate goals and is therefore a significant impact.

As noted in the methodology section, the region would need to reduce its VMT per capita at a rate of 0.4 percent per year (14.3 percent ÷ 34 years) over the next 34 years. Therefore, to stay on target, the region would need to achieve a reduction of 3.8 percent by Year 2025 conditions (0.4 percent annual reduction over a 9-year period). As shown above, under Year 2025 conditions, the proposed Plan would reduce the regional VMT per capita by ~~7.8~~6.8 percent compared to Baseline Year 2016 conditions. This is well above the interim target of 3.8 percent for Year 2025 conditions. Therefore, while implementation of the proposed Plan under Year 2025 conditions would not meet the State's full VMT reduction target of 14.3 percent, it would remain on target to reach this target by year 2050.

Implementation of the proposed Plan, under Year 2025 conditions, would result in an increase of ~~677,207~~692,029 residents living within a TPA, as well as ~~321,527~~362,087 additional jobs that would be located within a TPA compared to Baseline Year 2016 conditions. The transportation network improvements and land use changes in the proposed Plan would almost double the number of residents in TPAs as well as increase the number of jobs in TPAs by more than 50 percent. The regional growth by 2025 would amount to 158,656 residents and 116,328 jobs, most of which would occur in a TPA as transportation network improvements increase the overall TPAs in the region. As noted in CEQA Guidelines Section 15064.3(b)(1), land use projects

located within a TPA should generally be presumed to cause a less-than-significant transportation impact. However some growth by 2025 would occur outside TPAs.

Implementation of the proposed Plan, under Year 2025 conditions, would also result in an increase in total daily VMT generated in the region of ~~477,196~~923,702 (~~0.6~~1.1 percent) compared to Baseline Year 2016 conditions. The increase is considered substantial because it does not help achieve statewide GHG reduction goals, and is therefore significant. VMT growth in Year 2025 is predominantly due to the population and employment growth within the region, notwithstanding that the SCS land use pattern and the proposed transportation network improvements and programs in the proposed Plan would help to reduce VMT growth.

Additionally, as displayed previously in Table 4.16-6, implementation of the proposed Plan, in Year 2025, would increase the number of roadway lane miles within the region by ~~245~~ 233 miles. Some of the additional lane miles added to the network would be managed lanes (~~39~~ 34 miles); however, these improvements would still increase the overall vehicular capacity of the region's roadway network, resulting in the potential for induced travel. It should be noted that the majority of transportation improvements included within the proposed Plan, including expansion of transit services, new or expanded bicycle facilities, and pedestrian improvements, would decrease VMT within the region. As noted in OPR's Technical Advisory these types of multi-modal improvements are not anticipated to induce travel (OPR 2018). A detailed discussion of induced travel demand is provided in Appendix D of the 2021 Regional Plan.

2025 Conclusion

As shown in Table 4.16-17, implementation of the proposed Plan, under Year 2025 conditions, would result in a decrease in VMT per capita of ~~7.2~~6.8 percent below Baseline Year 2016 conditions. This is less than the 14.3 percent reduction CARB estimates will be needed to achieve 2050 State climate goals, and is therefore a significant impact. Implementation of the proposed Plan would also result in an increase of ~~477,196~~923,702 daily VMT generated within the San Diego region compared to Baseline Year 2016 conditions, which is considered a substantial increase. Therefore, this impact (TRA-2) is considered significant in the year 2025 because the proposed Plan would not achieve the substantial VMT reductions needed to help achieve statewide GHG reduction goals.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Table 4.16-18 summarizes the VMT projections and analysis developed under Year 2035 conditions. Total VMT and VMT per capita results are presented and compared between Baseline Year 2016 and the proposed Plan in Year 2035 to evaluate and identify VMT-related impacts. Additional metrics such as the projected population and employment, VMT per employee, and VMT per service population are also presented.

Table 4.16-18
VMT Analysis – Year 2035

Metric	Baseline Year 2016	Year 2035 Proposed Plan	Difference between Baseline Year 2016 and Year 2035 Proposed Plan	% Change between Base Year (2016) and Year 2035 Proposed Plan
Total VMT (daily)[1]	~~84,488,451~~ 83,614,704	~~87,009,311~~ 85,412,968	~~2,520,860~~ 1,798,264	~~3.0%~~2.2%
VMT per Capita (miles)[1,2]	~~19.53~~18.94	~~17.26~~16.58	~~-2.27~~-2.36	~~-11.6%~~-12.5%
Home-Based VMT[3]	~~63,769,566~~ 61,848,362	~~61,687,476~~ 59,251,034	~~-2,669,597~~ -2,597,328	~~4.1%~~4.2%
Population	3,265,489	3,573,645	308,156	9.4%
Employment	1,646,419	1,922,475	276,056	16.8%
VMT per Employee (miles)	~~19.56~~18.91	~~16.00~~15.26	~~-3.56~~-3.65	~~-18.2%~~-19.3%
VMT per Service Population (miles)	~~17.20~~17.02	~~15.83~~15.54	~~-1.37~~-1.48	~~-8.0%~~-8.7%
Population within TPAs	764,847 ~~764,847~~	1,985,967 ~~1,998,394~~	1,221,120 ~~1,233,547~~	159.7%~~161.3%~~
Employment within TPAs	609,253 ~~609,253~~	1,323,929 ~~1,313,329~~	714,676 ~~704,076~~	117.3%~~115.6%~~
Service Population within TPAs	1,374,100 ~~1,374,100~~	3,309,896 ~~3,311,723~~	1,935,796 ~~1,937,623~~	140.9%~~141.0%~~

Source: ABM2+

[1] The VMT calculations do not include the off-model VMT reduction strategy reductions totaling 891,099 (1.05% of the Total VMT) in Appendix S of the 2021 Regional Plan. Therefore, the VMT figures may be slightly overstated in the analysis. However, these reductions are not anticipated to reduce the impacts to less than significant.

[2] VMT per Capita = Home-Based VMT / Population

[3] Home-Based VMT is the total VMT within the region that is generated from trip tours that either start or end at home.

Notes:

- Highlighted rows indicate metrics that are used to evaluate VMT-related impacts.
- The revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.

As shown in Table 4.16-18, implementation of the proposed Plan, under Year 2035 conditions, would result in a ~~11.6~~12.5 percent decrease in the region's VMT per capita, compared to Baseline Year 2016 conditions. This is less than the 14.3 percent reduction CARB estimates eventually will be needed to achieve 2050 State climate goals and is therefore a significant impact.

As noted in the *Analysis Methodology* above, the region would need to reduce its VMT per capita at a rate of 0.4 percent per year (14.3 percent ÷ 34 year) over the next 34 years. Therefore, to stay on target, the region would need to reduction of 7.6 percent by Year 2035 conditions (0.4 percent annual reduction over a 19-year period). As shown above, under Year 2035 conditions, the proposed Plan would reduce the regional VMT per capita by ~~11.6~~12.5 percent ~~as achieve a~~ compared to Baseline Year 2016 conditions. This is well above the interim target of a 7.6 percent for Year 2035 conditions. Therefore, while implementation of the proposed Plan under Year 2035 conditions would not meet the State's full VMT reduction target of 14.3 percent, it would remain on target to reach this target by year 2050.

Implementation of the proposed Plan, under Year 2035 conditions, would result in an increase of ~~1,233,547~~1,221,120 residents in TPAs, as well as ~~704,076~~714,676 additional jobs in TPAs compared to Baseline Year 2016 conditions. The transportation network improvements and land use changes in the proposed Plan would increase the number of residents in TPAs by more than 2.5 times the current rate as well as more than double the number of jobs in TPAs. The regional growth by 2035 would be 308,156 residents and 276,056 jobs, most of which would occur in a TPA as transportation network improvements increase the overall TPAs in the region. As noted in CEQA Guidelines Section 15064.3(b)(1), land use projects located within a TPA should generally be presumed to cause a less-than-significant transportation impact. However, some growth by 2035 would occur outside of a TPA.

Implementation of the proposed Plan, under Year 2035 conditions, would also result in an increase in total daily VMT generated in the region of ~~2,520,860~~1,798,264 (~~3.2~~2.2 percent) compared to Baseline Year 2016 conditions. This increase is considered substantial because it does not help achieve statewide GHG reduction goals, and is therefore significant. VMT growth in Year 2035 is predominantly due to the population and employment growth within the region, notwithstanding that the SCS land use pattern and the proposed transportation network improvements and programs in the proposed Plan would help to reduce VMT growth.

Additionally, as displayed previously in Table 4.16-10, implementation of the proposed Plan, under Year 2035 conditions, would increase the number of roadway lane miles within the region by ~~622~~ 617 net miles. The majority of the additional lane miles added to the network would be managed lanes (~~436~~ 449 miles); however, these improvements would still increase the overall vehicular capacity of the region's roadway network, resulting in the potential for induced travel. It should be noted that the majority of transportation improvements included within the proposed Plan—including expansion of transit services, new or expanded bicycle facilities, and pedestrian improvements—would decrease VMT within the region. As noted in OPR's Technical Advisory these types of multi-modal improvements are not anticipated to induce travel (OPR 2018). A detailed discussion of induced travel demand is provided in Appendix D of the 2021 Regional Plan.

2035 Conclusion

As noted in Table 4.16-18, implementation of the proposed Plan, under Year 2035 conditions, would result in a decrease in the region's VMT per capita of ~~11.6~~12.5 percent below Baseline Year 2016 conditions. Off model strategies would only reduce this by 1.05 percent by 2035 for a total reduction of ~~12.64~~13.55 percent. This is less than the 14.3 percent reduction CARB estimates will be needed to achieve 2050 State climate goals, and is therefore a significant impact. Implementation of the proposed Plan would result in an increase of ~~2,520,860~~1,798,264 daily VMT generated within the San Diego region compared to Baseline Year 2016 conditions, which is considered a substantial increase. Therefore, this impact (TRA-2) is considered significant in the year 2035 because the proposed Plan would not achieve the substantial VMT reductions needed to help achieve statewide GHG reduction goals.

Although the proposed Plan does not meet the VMT reduction thresholds outlined in the Scoping Plan, the SCS in the proposed Plan does achieve the GHG reduction targets required under SB 375.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Table 4.16-19 summarizes the VMT projections and analysis developed under Year 2050 conditions. Total VMT and VMT per capita results are presented and compared between Baseline Year 2016 and the Proposed Plan

in Year 2050 to evaluate and identify VMT-related impacts. Additional metrics, such as the projected population and employment, VMT per employee, and VMT per service population, are also presented.

Table 4.16-19
VMT Analysis – Year 2050

Metric	Baseline Year 2016	Year 2050 Proposed Plan	Difference between Baseline Year 2016 and Year 2050 Proposed Plan	% Change between Baseline Year 2016 and Year 2050 Proposed Plan
Total VMT (daily)[1]	~~84,488,451~~ 83,614,704	~~90,100,203~~ 88,133,934	~~5,611,752~~ 4,519,230	~~6.6%~~5.4%
VMT per Capita (miles)[1,2]	~~19.53~~18.94	~~16.77~~16.03	~~-2.76~~-2.91	~~-14.1%~~-15.4%
Home-Based VMT[3]	~~63,769,566~~ 61,848,362	~~62,026,728~~ 59,300,949	~~-5,011,257~~ -2,547,412	~~-7.5%~~-4.1%
Population	3,265,489	3,699,373	433,884	13.3%
Employment	1,646,419	2,087,318	440,899	26.8%
VMT per Employee (miles)	~~19.56~~18.91	~~15.12~~15.26	~~-4.44~~-4.59	~~-22.7%~~-24.3%
VMT per Service Population (miles)	~~17.20~~17.02	~~15.57~~15.54	~~-1.63~~-1.79	~~-9.5%~~10.5%
Population within TPAs	1,985,967 ~~764,847~~	1,985,967 ~~2,126,134~~	1,221,120 ~~1,361,287~~	159.7% ~~178.0%~~
Employment within TPAs	1,323,929 ~~609,253~~	1,323,929 ~~1,463,359~~	714,676 ~~854,106~~	117.3% ~~140.2%~~
Service Population within TPAs	3,309,896 ~~1,374,100~~	3,309,896 ~~3,589,493~~	1,935,796 ~~2,215,393~~	140.9% ~~161.2%~~

Source: ABM2+

[1] The VMT calculations do not include the off-model VMT reduction strategy reductions totaling 1,865,474 (2.20% of the Total VMT) in Appendix S of the 2021 Regional Plan. Therefore, the VMT figures may be slightly overstated in the analysis. These reductions would most likely reduce the VMT per capita to below the 14.3 percent threshold; however, the region would still have an overall increase in total VMT, thus still resulting in a significant impact.

[2] VMT per Capita = Home-Based VMT / Population.

[3] Home-Based VMT is the total VMT within the region that is generated from trip tours that either start or end at home.

Notes:

- Highlighted rows indicate metrics that are used to evaluate VMT-related impacts.
- The revised numbers in this table reflect the minor modifications to the transportation network improvements included in the proposed Plan as well as minor corrections made to the ABM2+.~~Note: Highlighted rows indicate metrics that are used to evaluate VMT-related impacts.~~

As shown in Table 4.16-19, implementation of the proposed Plan under Year 2050 conditions would result in a ~~14.1~~15.4 percent decrease in the region's VMT per capita, compared to Baseline Year 2016 conditions. This is ~~less~~ greater than the 14.3 percent reduction CARB estimates will eventually be needed to achieve 2050 State climate goals, and is therefore the proposed Plan will have a less than~~a~~ significant impact on the State's climate goals, in regard to VMT per capita.

Implementation of the proposed Plan, under Year 2050 conditions, would result in an increase of ~~1,361,287~~1,361,021 residents in TPAs, as well as ~~854,106~~860,980 additional jobs in TPAs compared to 2016. The regional growth by 2050 would be 433,884 residents and 440,899 jobs, most of which would occur in a

TPA as transportation network improvements increase the overall TPAs in the region. As noted in CEQA Guidelines Section 15064.3(b)(1), land use projects located within a TPA should generally be presumed to cause a less-than-significant transportation impact. However, some growth by 2050 would occur outside of a TPA.

Implementation of the proposed Plan under Year 2050 conditions would also result in an increase in total daily VMT generated in the region of ~~5,611,752~~4,519,230 (~~6.6~~5.4 percent) compared to Baseline Year 2016 conditions. The increase is considered substantial because it does not help achieve statewide GHG reduction goals, and is therefore significant. VMT growth in Year 2050 is predominantly due to the population and employment growth within the region, notwithstanding that the SCS land use pattern and the proposed transportation network improvements and programs in the proposed Plan would help to reduce VMT growth.

Additionally, as shown in Table 4.16-14, implementation of the proposed Plan under Year 2050 conditions would increase the number of roadway lane miles within the region by ~~798~~ 788 net miles. The majority of the additional lane miles added to the network would be managed lanes (705 miles); however, these improvements would still increase the overall vehicular capacity of the region's roadway network, resulting in the potential for induced travel. It should be noted that the majority of transportation improvements included within the proposed Plan, including expansion of transit services, new or expanded bicycle facilities, and pedestrian improvements, would decrease VMT within the region. As noted in OPR's Technical Advisory these types of multi-modal improvements are not anticipated to induce travel (OPR 2018). A detailed discussion of induced travel demand is provided in Appendix D of the 2021 Regional Plan.

2050 Conclusion

As noted in Table 4.16-19, implementation of the proposed Plan under Year 2050 conditions would result in a decrease in VMT per capita of ~~14.1~~15.4 percent below Baseline Year 2016 conditions. When combined with the off model strategy reductions (approximately 2.2 percent) this would result in a total reduction of ~~16~~17.~~3~~6 percent in 2050, which is greater than the 14.3 percent reduction CARB estimates will be needed to achieve the 2050 State climate goals; however, the proposed Plan would result in an increase of ~~6.6~~5.4 percent of total VMT, and therefore the impact is considered significant. Implementation of the proposed Plan would result in an increase of ~~5,611,752~~4,519,230 daily VMT generated within the San Diego region compared to 2016 conditions, which is considered a substantial increase. Therefore, this impact (TRA-2) is considered significant in the year 2050 because the proposed Plan would not achieve the substantial VMT reductions needed to help achieve statewide GHG reduction goals.

Exacerbation of Climate Change Effects

It is uncertain whether the proposed Plan would exacerbate climate change effects on VMT. Extreme climate hazards like higher temperatures, heavy rainfall, wildfires, and flooding may change transit ridership, bicycling, and walking patterns (Melillo et al. 2014). If changes in climate cause people to drive rather than walk or take alternative forms of transit, it is possible that VMT would increase. However, if people adapt by moving closer to work or working from home, VMT may not increase. Thus, the proposed Plan's effect on exacerbating climate change VMT impacts is unknown.

TRA-2 CONFLICT OR BE INCONSISTENT WITH CEQA GUIDELINES SECTION 15064.3 BY NOT ACHIEVING THE SUBSTANTIAL VMT REDUCTIONS NEEDED TO HELP ACHIEVE STATEWIDE GHG REDUCTION GOALS

MITIGATION MEASURES

Achieving further reductions in the total and per capita VMT generated within the region depends upon additional State policy actions and funding, as well as local jurisdictions' review and entitlement of individual land use development projects and Regional Arterial System (RAS) transportation projects. In addition, transportation sponsors other than SANDAG, such as Caltrans, must evaluate and potentially mitigate any induced VMT that may be associated with the implementation of enhancements to the freeway and State Highway system.

Therefore, mitigation measure TRA-2 focuses on project-specific mitigation measures that can and should be implemented to further reduce the region's total VMT and VMT per capita. In addition, a regional plan-level alternative, Alternative 3, would further reduce VMT through measures such as more compact land use patterns, and policies to reduce transit fares, increase parking prices, and establish higher road user fees; this alternative is analyzed in Chapter 6, *Alternatives Analysis.*

2025, 2035, and 2050

The following mitigation measures presented in Section 4.8 will further reduce both the total VMT and VMT per capita:

- **GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans**
- **GHG-5d Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide**
- **GHG-5f Implement Measures to Reduce GHG Emissions from Development Projects**

In addition, the following measure is proposed:

TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects. During the project design and project-level CEQA review phases of transportation network improvements or land use development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should implement project-level VMT reduction measures in addition to those included in the Regional Plan. VMT reducing measures include, but are not limited to, the following:

- **Require TDM Strategies** – SANDAG shall and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should require all transportation network improvements or land use development projects, that are identified to have a significant VMT-related impact, to implement feasible TDM strategies to help offset their impacts. This mitigation measure will further reduce the proposed Plan's VMT because the potential VMT reductions associated with four[9] TDM programs, which include pooled rides (private), vanpool, carshare, and the implementation of a regional TDM ordinance, were not incorporated into ABM2+[10]. Strategies such as free shuttles, parking facilities for

[9] Five total measures are evaluated in the "Off-Model" calculations included in Appendix D of the 2021 Regional Plan. However, EV Programs (Vehicle Incentive and Charger Program) only relates to reductions in GHG and does not help to reduce VMT specifically. See Appendix D of the 2021 Regional Plan

[10] These TDM strategies were calculated as part of the off-model strategies (Appendix S of the 2021 Regional Plan). If implemented these strategies could reduce total VMT by 1.05 percent by 2035 and 2.2 percent by 2050 (Appendix S of the 2021 Regional Plan).

carshare, and site design features to facilitate walking, biking, and transit can and should be used by land development projects to reduce VMT-related impacts. Additional project-level TDM measures not included in the proposed Plan can and should also be used, include walking, school bus programs, school pool programs, subsidized transit passes, unbundled parking, preferential parking programs for carpools/vanpools, and bike sharing programs.

- **Reduce Parking Minimums** – The County of San Diego, cities, and other local jurisdictions can and should evaluate the feasibility of reducing their currently required parking minimums. Reducing the parking minimums for different land use types, where appropriate, can decrease project-level VMT by up to 12.5 percent (CAPCOA 2010).
- **Implement Additional Active Transportation Facilities Not Included in the Proposed Plan** – To further reduce local VMT-related impacts and take advantage of the regional bike network, SANDAG shall and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should implement additional active transportation facilities that provide connections from the regional bicycle network to local neighborhoods. The proposed Plan includes funding for Complete Streets investments in Mobility Hub areas including implementation of bicycle and pedestrian facilities that provide local connections throughout Mobility Hub areas; however, the associated VMT reductions from this funding could not be modeled, so this mitigation measure would achieve further VMT reductions. Direct access to bicycle facilities can reduce project-related VMT by 0.65 percent, while incorporating new pedestrian facilities can reduce project VMT by up to 2 percent (CAPCOA 2010).
- **Road Diet and Traffic Calming** – The County of San Diego, cities, and other local jurisdictions can and should implement road diets[11] or other traffic calming measures within their local roadway network, where feasible, to further reduce VMT-related impacts that may be associated with land development projects or local transportation projects. Road diet and traffic calming measures would also be eligible for Complete Streets funding in Mobility Hub areas. The reduction of existing travel lanes in favor of multi-modal facilities or additional public space can help to calm and deter vehicular trips within an area or along a roadway segment. Traffic calming measures can reduce VMT by 0.5 percent (CAPCOA 2010). It should be noted that the proposed Plan includes funding, through grants, for local jurisdictions to implement road diets.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

By Year 2050 the proposed Plan would reduce the region's VMT per capita by ~~14.1~~15.4 percent over Baseline Year 2016 conditions. As outlined in Tables S-17 through S-22 in Appendix S of the proposed Plan, there are some TDM strategies included in the proposed Plan that could not be incorporated into ABM2+ and were therefore not assumed in the transportation impact analysis. As noted within the appendix, these reductions could further reduce the total VMT generated within the region by an additional 2.2 percent by Year 2050. These reductions were calculated based on their influence of the total VMT generated within the region. As such, it is reasonable to assume that these strategies would have a similar effect on region's VMT per capita, as the majority of trips within the region are home based. Therefore, the region could achieve reductions of up to of ~~16.3~~17.6 percent (~~14.1~~15.4 + 2.2 percent) in VMT per capita, over 2016 conditions, by 2050,[12] if these

[11] Road Diet = narrowing or eliminating travel lanes and/or shoulders to provide more space for pedestrians, bicyclists, transit, or public spaces.

[12] This exceeds the CARB target reduction of 14.3 percent by 2050.

strategies are fully implemented. However, as noted in the mitigation section above, TDM strategies generally are required and implemented at the project level, by local agencies, to be most effective. The VMT reductions associated with these project-level TDM measures can vary greatly based on the project type, location, and size; therefore, an overall regionwide reduction cannot be estimated at the program level.

SANDAG cannot require local agencies implementing development projects, or other transportation project sponsors, to adopt the above mitigation measures, and it is ultimately the responsibility of the CEQA lead agency to determine and adopt mitigation. In addition, the State has indicated that additional State policy actions and funding would be required to close the VMT gap between what the MPOs could achieve through implementation of their SCSs and reductions needed to meet State goals. Therefore, this impact would be significant and unavoidable.

TRA-3 SUBSTANTIALLY INCREASE HAZARDS DUE TO A DESIGN FEATURE (E.G., SHARP CURVES OR DANGEROUS INTERSECTIONS) OR INCOMPATIBLE USES

ANALYSIS METHODOLOGY

The focus of this analysis is to determine if implementation of the proposed Plan would lead to new or increased safety hazards within the region's transportation network. The proposed Plan contains various projects that would modify or expand the regional transportation network. These projects were developed to address existing deficiencies and/or future needs given projected population, employment, and travel growth in the region. If implementation of these projects were determined to increase hazards within the region's transportation network (e.g., increase the likelihood of collisions or other dangers) there would be a significant impact. The impact analysis focuses on consistency with design standards related to traffic safety in order to determine whether impacts are significant. The impact analysis considers the proposed Plan's transportation network improvements and programs, but not the proposed Plan's regional growth and land use change, because the Impact TRA-3 significance criterion is limited to transportation project safety hazard issues.

IMPACT ANALYSIS

2025

Transportation Network Improvements and Programs

The proposed Plan would expand regional transportation safety programs and efforts. Highlighted below are several planning efforts included in the proposed Plan that would improve transportation safety within the region:

- *Development of Regional Vision Zero Program:* The proposed Plan introduces the Vision Zero Program with the aim of keeping all roadway users—especially vulnerable users—safe through the use of data, project prioritization, education, and community engagement.
- *Proposed Plan Network Development*: Safety data were applied to project bundles during the network-development process through evaluation criteria. See Appendix T of the 2021 Regional Plan for more information.
- *Federal Transportation Performance Management*: Planning and programming are informed by five safety performance targets for all public roads and seven transit safety performance targets that the lead CEQA agency monitors and updates on a regular schedule. See Appendix O of the 2021 Regional Plan for more information.

- *Strategic Highway Safety Plan*: The proposed Plan is consistent with the 2020 Strategic Highway Safety Plan (SHSP). SANDAG supported the development of this statewide plan and continues support of plan implementation through SHSP Challenge Area Teams.
- *Comprehensive Multimodal Corridor Plans (CMCPs)*: These subregional plans develop groupings of transportation projects that are evaluated using performance measures, including safety improvements (SANDAG 2021d).

The transportation network improvements and programs in the proposed Plan would be required to conform to the design standards of the public agency responsible for implementation. Design standard conformance is a key part of developing networks that provides common expectations for users to minimize hazardous conflicts and conditions that could contribute to collisions. The standards outlined in the California MUTCD, HDM, and MTS' *Design for Transit* (see Section 4.16.2), as well as the street design manuals established by the local jurisdictions, cover all aspects of the transportation right-of-way, including physical and operational features as well as appropriate actions during construction.

The transportation network improvements and programs included under Year 2025 conditions in the proposed Plan would not change the applicable safety design standards of the implementing agencies. The transportation network improvements would be designed consistent with those standards. Further, the proposed Plan includes several planning efforts that would improve transportation safety within the region. Therefore, this impact is less than significant.

2025 Conclusion

Implementation of the proposed Plan, under 2025 conditions, would not change the applicable design standards of the implementing agencies, and the transportation network improvements would be designed consistent with those standards. Further, the proposed Plan includes several planning efforts that would improve transportation safety. Therefore, impacts would be less than significant.

2035

Transportation Network Improvements and Programs

The proposed Plan would expand regional transportation safety programs and efforts. As highlighted in the 2025 impact analysis, there are several planning efforts included in the proposed Plan that would improve transportation safety within the region.

The transportation network improvements and programs in the proposed Plan would be required to conform to the design standards of the public agency responsible for implementation. Design standard conformance is a key part of developing networks that provides common expectations for users to minimize hazardous conflicts and conditions that could contribute to collisions. The standards outlined in the California MUTCD, HDM, and MTS' *Design for Transit* (see Section 4.16.2), as well as the street design manuals established by the local jurisdictions, cover all aspects of the transportation right-of-way, including physical and operational features as well as appropriate actions during construction.

The transportation network improvements and programs included under Year 2025 conditions in the proposed Plan would not change the applicable safety design standards of the implementing agencies. The transportation network improvements would be designed consistent with those standards. Further, the proposed Plan includes several planning efforts that would improve transportation safety within the region. Therefore, this impact is less than significant.

2035 Conclusion

Implementation of the proposed Plan, under 2035 conditions, would not change the applicable design standards of the implementing agencies, and the transportation network improvements would be designed consistent with those standards. Further, the proposed Plan includes several planning efforts that would improve transportation safety. Therefore, impacts would be less than significant.

2050

Transportation Network Improvements and Programs

The proposed Plan would expand regional transportation safety programs and efforts. As highlighted in the 2025 impact analysis, there are several planning efforts included in the proposed Plan that would improve transportation safety within the region.

The transportation network improvements and programs in the proposed Plan would be required to conform to the design standards of the public agency responsible for implementation. Design standard conformance is a key part of developing networks that provides common expectations for users to minimize hazardous conflicts and conditions that could contribute to collisions. The standards outlined in the California MUTCD, HDM, and MTS' *Design for Transit* (see Section 4.16.2), as well as the street design manuals established by the local jurisdictions, cover all aspects of the transportation right-of-way, including physical and operational features as well as appropriate actions during construction.

The transportation network improvements and programs included under Year 2025 conditions in the proposed Plan would not change the applicable safety design standards of the implementing agencies. The transportation network improvements would be designed consistent with those standards. Further, the proposed Plan includes several planning efforts that would improve transportation safety within the region. Therefore, this impact is less than significant.

2050 Conclusion

Implementation of the proposed Plan, under 2050 conditions, would not change the applicable design standards of the implementing agencies, and the transportation network improvements would be designed consistent with those standards. Further, the proposed Plan includes several planning efforts that would improve transportation safety. Therefore, impacts would be less than significant.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects regarding substantially increasing hazards due to a design feature, assuming that applicable design standards incorporate projections for future climate conditions.

TRA-4 LEAD TO A LACK OF PARKING SUPPLY THAT WOULD CAUSE SIGNIFICANT SECONDARY ENVIRONMENTAL IMPACTS NOT ALREADY ANALYZED IN THE EIR

ANALYSIS METHODOLOGY

Per Public Resources Code Section 2099(d)(1), parking impacts are not considered an environmental impact under CEQA for residential, mixed-use residential, or employment center projects located on an infill site within

a TPA. The majority of the proposed policies in the proposed Plan relating to parking operations and management would occur within a TPA. Changes in parking operations, supply, and management can, however, have an effect on the way people travel within the region and ultimately influence VMT. These changes may affect the air quality, energy, and GHG impact impacts, as disclosed within Sections 4.3, 4.6, and 4.8 of this EIR, respectively.

IMPACT ANALYSIS

2025

Transportation Network Improvements and Programs

One of the proposed Plan core strategies is to implement innovative parking demand and system management tools to help reduce solo driving and congestion. This would be accomplished through policies that encourage increases in remote working, carsharing, vanpooling, pricing strategies, and parking management programs that leverage partnerships and technology. The following policies in the proposed Plan pertain to the proposed Plan's vision on how public parking can be improved within the region.

Mobility Hubs

- Intelligent Transportation Solutions, which include wireless electric vehicle charging, smart parking solutions, infrastructure supporting automated and connected vehicles, and dynamically managed curbs.

Regional Pricing Strategy

- Parking and curb pricing: combined with the availability of convenient alternatives to driving alone and effective parking management strategies, charging for parking encourages vehicular turnover and reduces congestion as drivers search for a parking spot. Better management of valuable curb space also includes pricing to encourage a rapid turnover by commercial vehicles, rideshare services, shuttles, and parcel delivery vehicles. The result: access is maximized for a wider range of popular services. Local jurisdictions are responsible for managing parking and curb space. SANDAG will provide resources and technical support to jurisdictions in developing parking and curb pricing strategies.

As noted in the policies above, the parking strategies and policies included in the proposed Plan would incorporate technology into both public on-street parking and Mobility Hubs. This is intended to let travelers know, in real time, where parking is available and its associated cost. This technology would help to reduce the number of motorists who are circling around busy areas in search of available parking, thus reducing associated VMT as well as associated GHG emissions that affect air quality. The technology would also allow for dynamic pricing, where the hourly cost of parking increases as parking becomes less available. Dynamic pricing incentivizes travelers to utilize other modes of travel during peak times, thus potentially reducing VMT. The California Air Pollution Control Officers Association (CAPCOA) finds that charging for public parking or increasing the existing price of parking can reduce VMT by 2.8 to 5.5 percent (CAPCOA 2010). This strategy and its associated effects are incorporated into the ABM2+, which uses travel survey data to determine how the cost to operate a vehicle (including gas prices, maintenance, tolls, and parking costs) affects a traveler's choice in modes.

The parking strategies and policies outlined above were reflected in the ABM2+ results for the proposed Plan and are reflected in the VMT results outlined in Table 4.16-17. As shown, the VMT per capita, VMT per employee, and VMT per service population would decrease under the proposed Plan, which includes the effects of proposed parking strategies and policies.

It should be noted that the ABM2+ does not specifically account for additional localized VMT that could be generated by additional vehicles in search of parking. Therefore, any VMT effects specifically associated with parking shortages cannot be quantified and would be dictated by local conditions, to which the model is not sensitive.[13] The effect on VMT associated with additional vehicles circling around and looking for available parking, or cheaper parking, is likely negligible on a regional scale, and would be offset by the VMT reductions from the parking strategies and policies described above.

2025 Conclusion

Proposed Plan parking strategies and policies were integrated into the Year 2025 VMT results analyzed under Impact TRA-2. These VMT results were relied upon for air quality, energy, and GHG impact analyses conducted in Sections 4.3, 4.6, and 4.8. Therefore, the proposed Plan would not lead to a lack of parking supply that would cause significant secondary impacts not already analyzed in the EIR, and this impact is less than significant.

2035

Transportation Network Improvements and Programs

As noted previously, the parking strategies and policies included in the proposed Plan would incorporate technology into both public on-street parking and Mobility Hubs. This is intended to let travelers know, in real time, where parking is available and its associated cost. This technology would help to reduce the number of motorists who are circling around busy areas in search of available parking, thus reducing associated VMT as well as associated GHG emissions that affect air quality. The technology would also allow for dynamic pricing, where the hourly cost of parking increases as parking becomes less available. Dynamic pricing incentivizes travelers to utilize other modes of travel during peak times, thus potentially reducing VMT. The CAPCOA *Quantifying Greenhouse Gas Mitigation Measures* (2010), finds that charging for public parking or increasing the existing price of parking can reduce VMT by 2.8 to 5.5 percent. This strategy and its associated effects are incorporated into the ABM2+, which uses travel survey data to determine how the cost to operate a vehicle (including gas prices, maintenance, tolls, and parking costs) affects a traveler's choice in modes.

The parking strategies and policies outlined above were reflected in the ABM2+ results for the proposed Plan and are reflected in the VMT results outlined in Table 4.16-18. As shown, the VMT per capita, VMT per employee, and VMT per service population would decrease under the proposed Plan, which includes the effects of proposed parking strategies and policies.

It should be noted that the ABM2+ does not specifically account for additional localized VMT that could be generated by additional vehicles in search for parking. Therefore, any VMT effects specifically associated with parking shortages cannot be quantified and would be dictated by local conditions, to which the model is not

[13] Per CEQA Guidelines Section 15064.3(b)(3), if current models are not sufficiently refined to capture the indirect VMT effects of a project, then such analysis can be performed qualitatively.

sensitive.[14] The effect on VMT associated with additional vehicles circling around and looking for available parking, or cheaper parking, is likely negligible on a regional scale, and would be offset by the VMT reductions from the parking strategies and policies described above.

2035 Conclusion

Proposed Plan parking strategies and policies were integrated into the Year 2035 VMT results analyzed under Impact TRA-2. These VMT results were relied upon for air quality, energy, and GHG impact analyses conducted in Sections 4.3, 4.6, and 4.8. Therefore, the proposed Plan would not lead to a lack of parking supply that would cause significant secondary impacts not already analyzed in the EIR, and this impact is less than significant.

2050

Transportation Network Improvements and Programs

The parking strategies and policies included in the proposed Plan would incorporate technology into both public on-street parking and Mobility Hubs. This is intended to let travelers know, in real time, where parking is available and its associated cost. This technology would help to reduce the number of motorists who are circling around busy areas in search of available parking, thus reducing associated VMT as well as associated GHG emissions that affect air quality. The technology would also allow for dynamic pricing, where the hourly cost of parking increases as parking becomes less available. Dynamic pricing incentivizes travelers to utilize other modes of travel during peak times, thus potentially reducing VMT. CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures* (2010), finds that charging for public parking or increasing the existing price of parking can reduce VMT by 2.8 to 5.5 percent. This strategy and its associated effects are incorporated into the ABM2+, which uses travel survey data to determine how the cost to operate a vehicle (including gas prices, maintenance, tolls, and parking costs) affects a traveler's choice in modes.

The parking strategies and policies outlined in the year 2025 analysis were reflected in the ABM2+ results for the proposed Plan and are reflected in the VMT results outlined in Table 4.16-19. As shown, the VMT per capita, VMT per employee, and VMT per service population would decrease under the proposed Plan, which includes the effects of proposed parking strategies and policies.

It should be noted that the ABM2+ does not specifically account for additional localized VMT that could be generated by additional vehicles in search for parking. Therefore, any VMT effects specifically associated with parking shortages cannot be quantified and would be dictated by local conditions, to which the model is not sensitive.[15] The effect on VMT associated with additional vehicles circling around and looking for available parking, or cheaper parking, is likely negligible on a regional scale, and would be offset by the VMT reductions from the parking strategies and policies described above.

2050 Conclusion

Proposed Plan parking strategies and policies were integrated into the Year 2050 VMT results analyzed under Impact TRA-2. These VMT results were relied upon for air quality, energy, and GHG impact analyses conducted

[14] Per CEQA Guidelines Section 15064.3(b)(3), if current models are not sufficiently refined to capture the indirect VMT effects of a project, then such analysis can be performed qualitatively.

[15] Per CEQA Guidelines Section 15064.3(b)(3), if current models are not sufficiently refined to capture the indirect VMT effects of a project, then such analysis can be performed qualitatively.

in Sections 4.3, 4.6, and 4.8. Therefore, the proposed Plan would not lead to a lack of parking supply that would cause significant secondary impacts not already analyzed in the EIR, and this impact is less than significant.

Exacerbation of Climate Change Effects

The proposed Plan is not expected to exacerbate climate change effects on parking supply.

4.17 TRIBAL CULTURAL RESOURCES

This section evaluates the tribal cultural resources impacts of the proposed Plan.

4.17.1 EXISTING CONDITIONS

Assembly Bill (AB) 52, as discussed below, amended CEQA to add another category of cultural resource: tribal cultural resources (TCRs). TCRs are defined as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a tribe," which are either "included in or determined to be eligible for inclusion in the California Historic Register" or "included in a local register of historical resources" (Public Resources Code [PRC] Section 21074). A lead agency may also determine, based on its discretion and substantial evidence, that a resource is a tribal cultural resource based on the criteria used to determine whether a historical resource is eligible for listing in the California Register of Historical Resources (CRHR) set forth in PRC Section 5024.1(c). In applying those criteria, the lead agency is to consider the significance of the resource to the relevant California Native American tribe (PRC Section 21074(a)(2)).

ETHNOGRAPHIC RESOURCES AND SACRED SITES

Ethnographic resources that are potential TCRs include sites, areas, and materials important to Native Americans for religious, spiritual, or traditional uses. These can encompass the sacred character of physical locations (mountain peaks, springs, and burial sites) or particular native plants, animals, or minerals that are gathered for use in traditional ritual activities. Villages, camps and activity areas, burials, rock art, rock features, and traditional hunting, gathering, or fishing sites may also constitute significant Native American cultural resources. TCRs tend to fall into distinctive categories that relate to cosmology or activities that took place. They are found throughout the region, but tend to be physical geographic landmarks or in areas close to a water source or resources (such as materials for tool making or readily available food), and on flatter ground. TCRs can be found on the surface, or buried. TCRs close to water sources that were originally just superficial can be buried over time by alluvial action. See additional discussion in Section 4.5, *Cultural Resources*.

TCRs are more likely to have been destroyed within historic urbanized and commercial areas; namely along the highly developed coastal region, although this does not preclude the presence in urban or developed settings of buried archaeological resources that may meet the definition of a TCR. A greater number of surficial TCRs and buried archaeological TCRs are more likely to have been previously documented as traditional cultural places, sacred sites, or archaeological sites resulting from cultural resources studies and outreach to Native Americans during environmental analysis for previous projects throughout the region. As discussed above, the NAHC maintains a confidential inventory of California Native American sacred sites, which may be archaeological sites, cultural landscapes, locations used for traditional resource gathering, or sacred places. An unknown number of these sites may meet the definition of a TCR. In addition, it is likely there are other TCRs in the Plan Area that have not been documented or evaluated. Large portions of the Plan Area have not been subjected to cultural resource survey or consultation with Native American tribes and may contain TCRs. Additionally, there are likely a number of documented archaeological resources, landscapes, and sacred places that have not been evaluated as TCRs.

A records search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) completed for the Plan Area was obtained from the NAHC on August 13, 2018. Results of the SLF search indicate that Native American cultural sites are present in the Plan Area. The specific locations and descriptions of the sites are

confidential. The NAHC also provided a list of tribes that are traditionally and culturally affiliated with the geographic area of the proposed Plan.

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

Climate change may threaten tribal cultural resources due to sea-level rise submerging coastal lands, more frequent and severe precipitation events, higher temperatures, and higher incidence of wildfire. The San Diego region is likely to experience sea level rise of up to 1.2 feet by 2050, wetter winters and more intense precipitation that can lead to increased flooding, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season. More details on future climate projections are available in Appendix C.

There is limited research on the climate impacts on tribal cultural resources in the San Diego region; however, there is some information about national impacts that could be relevant to tribes in the region. Climate change could pose various physical, economic, and social threats to tribal cultural resources (Marchand et al. 2017). Potential climate impacts include loss or damage of material culture; losses of ecological resources including agricultural land, traditional foods, forests and forest products; threats to tribal rights to fish, hunt, and gather; and loss of water supplies (Marchand et al. 2017, NWIFC 2016). While many similar impacts could occur for the general population, they may be more severe for indigenous populations who are more socio-economically vulnerable (Marchand et al. 2017).

Sea level rise and coastal erosion could damage or destroy coastal TCRs that are exposed to temporary or permanent coastal flooding (NWIFC 2016). Above-ground structures may be particularly exposed to coastal flooding, but a rising water table or salinization of water could potentially affect below-ground TCRs, such as archeological resources.

Extreme precipitation events may lead to more severe, more extensive, or more frequent flooding events on tribal lands. To the extent that TCRs are exposed to these floods, the TCRs may be physically damaged from the water or the debris it carries, or from the resulting erosion (Curry et al. 2011, Flanigan, Thompson, and Reed 2018). Extreme precipitation can also contribute to soil destabilization and landslides, which could damage or destroy TCRs.

Changes in temperature and precipitation could also damage cultural resources, although the extent to which these could negatively affect archaeological and cultural resources in the San Diego region has not been quantified. If freeze/thaw cycles become more frequent or dramatic, which can happen under warming scenarios, when temperatures rise above freezing during the day and then dip below freezing at night, rather than just staying below freezing, this can physically damage TCRs. Freeze/thaw cycles negatively affect stone and brick buildings structures (Rockman et al. 2016). Higher temperatures can cause faster rates of deterioration due to thermal stress and biological activity, more rapid decay of organic materials, heat stress on culturally significant vegetation, and loss of culturally significant habitat and species due to disease and temperature changes (Rockman et al. 2016). Heavy precipitation and flooding could damage cultural resources due to site erosion and destabilization, direct physical damage to the site, loss of artifacts due to flooding, and increased risk of post-flood subsidence (Rockman et al. 2016).

More frequent and intense wildfires may damage or destroy TCRs (Rockman et al. 2016, Curry et al. 2011, NWIFC 2016), particularly above-ground TCRs. Wildfires can increase damage to archaeologically relevant structures, alter the artifacts exposed to extreme heat, increase susceptibility to erosion and flooding, and exacerbate damages due to firefighting activities (Rockman et al. 2016). Wildfire could damage historical

structures or alter their distinct physical characteristics as older buildings may not have as robust defenses against wildfire as modern buildings (Rockman et al. 2016). Wildfires can also contribute to soil destabilization and landslides, which present risks to TCRs (Santin and Doerr 2016, NWIFC 2016).

It is possible that sea-level rise, flooding, wildfire, and landslides could reveal or damage human remains. Remains exposed to the environment from climate hazards may then be further damaged by extreme weather; for example, changes in temperature and precipitation could speed deterioration and decay, cause thermal stress, and cause erosion (Rockman et al. 2016).

4.17.2 REGULATORY SETTING

Cultural resources, which include TCRs, are indirectly protected under the provisions of the Federal Antiquities Act of 1906 (16 U.S. Code [USC] Sections 431 et seq.) and subsequent related legislation, regulations, policies, and guidance documents. Federal, State, and local regulatory frameworks related to the protection of cultural resources in California are presented in the regulatory setting of Section 4.5. Numerous laws and regulations require that federal, State, and local agencies consider the effects of a proposed project on cultural resources, which may include TCRs.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

AB 52 and Tribal Cultural Resources

In September 2014, the California Legislature passed AB 52, which added provisions to the PRC regarding the evaluation of impacts on TCRs under CEQA, and consultation requirements with California Native American tribes. AB 52 requires lead agencies to analyze project impacts on TCRs. (PRC Sections 21074 and 21083.09). The bill added a definition of "tribal cultural resources" in PRC Section 21074 (presented above), and added requirements for lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC Sections 21080.3.1, 21080.3.2, and 21082.3). Also, as required by AB 52, the Governor's Office of Planning and Research (OPR) updated Appendix G of the State CEQA Guidelines to provide sample questions regarding impacts on TCRs (PRC Section 21083.09).

Under AB 52, lead agencies must consult with tribes that have requested consultation and have a traditional and cultural affiliation with the geographic area of a proposed project (PRC 21080.3.1). To trigger the requirement to consult, a tribe must first send the lead agency a written request for formal notification of any proposed projects within the geographic area with which they are traditionally and culturally affiliated. If such a request is received, the lead agency must provide that tribe(s) notice within 14 days of either deciding to undertake a project or determining a project's application is complete (PRC Section 21080.3.1(d)). If the tribe responds within 30 days with a request for consultation, the lead agency must begin the consultation process within 30 days receiving the request (PRC Section 21080.3.1(d)).

Regarding the consultation topics, the tribe can request to be consulted on the type of environmental review necessary, the significance of TCRs, the significance of the project's impacts on TCRs, and, if necessary, project alternatives or the appropriate measures for preservation or mitigation that the California Native American tribe may recommend to the lead agency" (PRC Section 21080.3.2(a)).

Regarding mitigation measures, AB 52 provides that if the tribal consultation process results in agreed-upon mitigation measures, then such measures must be recommended for inclusion in the environmental document if determined to avoid or lessen a significant impact on a tribal cultural resource (PRC Section 21082.3(a)). However, if the recommended mitigation is not included in the environmental document, if no mitigation

measures were agreed upon in consultation, or if no consultation occurred, and if the proposed project would cause a significant impact on a tribal cultural resource, the lead agency must consider feasible mitigation measures pursuant to PRC Section 21084.3 (PRC Section 21082.3(e)).

Results of the Regional Plan AB 52 Consultation Process

SANDAG regularly coordinates with the Interagency Technical Working Group on Tribal Transportation Issues (Working Group). The Working Group is composed of a representative from each federally recognized tribal government and California tribe in San Diego County that chooses to participate in the Working Group, and serves as a forum for tribal governments in the region to discuss and coordinate transportation issues of mutual concern with the various public planning agencies in the region. The Working Group is co-chaired by a tribal member and a member of the SANDAG executive staff. Tribal representatives are voting members of the Working Group, and SANDAG and other public agencies impacting tribal transportation issues serve as advisory members of the Working Group. The Working Group meets quarterly, as determined by the group. These meetings are not formal consultation pursuant to AB 52, but instead implement a Tribal Consultation Plan developed by the Southern California Tribal Chairmen's Association (SCTCA) and SANDAG (Appendix I of the proposed Plan) intended to guide consultation with tribes on regional transportation issues, including the development of the proposed Plan.

On October 5, 2016, in compliance with AB 52, SANDAG contacted representatives from the following 19 tribes in San Diego County, via certified mail, inviting each tribe to consult on the proposed Plan pursuant to AB 52. Of the nineteen tribes contacted, only the San Luis Rey Band of Luiseño Indians had previously requested to be notified of SANDAG projects.

- Barona Band of Mission Indians
- Campo Kumeyaay Nation
- Ewiiaapaayp Band of Kumeyaay Indians
- Iipay Nation of Santa Ysabel
- Inaja-Cosmit Reservation/Inaja Cosmit Band
- Jamul Indian Village of California
- La Jolla Band of Luiseño Indians
- La Posta Band of Mission Indians
- Los Coyotes Band of Cahuilla Indians
- Manzanita Band of Mission Indians
- Mesa Grande Band of Mission Indians
- Pala Band of Mission Indians
- Pauma Band of Luiseño Indians
- Pechanga Band of Luiseño Indians (recently gained trust land in San Diego County)
- Rincon Luiseño Band of Indians
- San Luis Rey Band of Mission Indians
- San Pasqual Band of Diegueño Indians

- Sycuan Band of the Kumeyaay Nation
- Viejas Band of Kumeyaay Indians

Eleven tribes did not respond to SANDAG's invitation to consult on the proposed Plan; however, the following eight tribes responded to the invitation and requested to consult on the proposed Plan pursuant to AB 52:

- Campo Kumeyaay Nation
- Jamul Indian Village of California
- La Posta Band of Mission Indians
- Pala Band of Mission Indians
- Rincon Luiseño Band of Indians
- San Luis Rey Band of Mission Indians
- San Pasqual Band of Diegueño Indians
- Sycuan Band of the Kumeyaay Nation

On November 18, 2016, SANDAG formally initiated consultation with the eight tribes via certified mail. The letter included an invitation to an initial in-person meeting to discuss the consultation process, in a private meeting limited to the tribe's designated representatives and SANDAG, during a future public meeting of the Working Group, or through another approach preferred by the tribe. The letter suggested arranging a meeting for early 2017 and requested a reply.

On February 23, 2017, SANDAG and representatives from five tribes met at the Jamul Indian Village Tribal Community Center to discuss the proposed Plan and EIR. Attendees generally agreed that discussion should be continued at a future meeting. It was agreed that SANDAG would send a letter to all eight tribes that had requested AB 52 consultation, and invite them to attend a future meeting if they are interested. SANDAG agreed it would send such a letter. The five tribes that participated in this meeting were:

- Campo Kumeyaay Nation
- Jamul Indian Village
- La Posta Band of Mission Indians
- Pala Band of Mission Indians
- Sycuan Band of the Kumeyaay Nation

On March 7, 2017, SANDAG sent a second letter to the eight consulting tribes requesting to meet regarding AB 52 consultation on the EIR, either in private or during a Working Group session. The letter suggested arranging a meeting for March or April 2017 and requested a reply. On March 15, 2017, SANDAG sent a follow-up email to each consulting tribe, with the March 7, 2017, letter attached, and requested a reply. To date, SANDAG has not received a response from seven of the eight consulting tribes.

On August 14, 2017, SANDAG and tribal representatives of the Rincon Luiseño Band of Indians met at the tribe's office. At that confidential meeting, SANDAG and the tribal representatives discussed the proposed Plan and the EIR's analytical approach, as well as the tribe's initial input on the proposed Plan and EIR and the Luiseño ancestral territory. On August 15, 2017, the Rincon Luiseño Band of Indians agreed to conclude consultation for the EIR via e-mail to SANDAG from Ms. Destiny Colocho, the tribe's Cultural Resources Manager. As a result

of the consultation, SANDAG will include the tribe in the distribution of the Draft EIR for the proposed Plan, and the tribe will be given the opportunity to provide comments on the EIR. On June 14, 2021, SANDAG sent a letter via certified mail to Ms. Colocho formally concluding consultation pursuant to PRC Section 21080.3.2(b).

At a quarterly Working Group meeting held on October 31, 2018, SANDAG shared an update on AB 52 consultation for the proposed Plan. The update described SANDAG's invitation to consult on the proposed Plan, the responses from eight tribes, the February 2017 meeting with five consulting tribes, and SANDAG's follow-up letters in March 2017 seeking to continue consultation on the EIR. SANDAG again invited consulting tribes to meet individually or collectively with SANDAG or to provide input through written or email correspondence, or provide a statement that it wished to conclude AB 52 consultation. To date, none of the tribes have responded to SANDAG's invitation to consult further on the EIR or to conclude AB 52 consultation.

On June 14, 2021, SANDAG sent letters to the seven consulting tribes who participated in initial AB 52 consultation on the EIR, but who have not responded to further efforts by SANDAG to continue consultation. This letter thanked the tribes for participating in consultation on the proposed Plan and respectfully concluded consultation pursuant to PRC Section 21080.3.2(b).

California Government Code Sections 6254(r) and 6254.10

California Government Code Sections 6254(r) and 6254.10 of the California Public Records Act were enacted to protect archaeological sites from unauthorized excavation, looting, or vandalism. Section 6254(r) explicitly authorizes public agencies to withhold information from the public relating to "Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission." Section 6254.10 specifically exempts from disclosure requests for "records that relate to archaeological site information and reports, maintained by, or in the possession of the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, the Native American Heritage Commission, another state agency, or a local agency, including the records that the agency obtains through a consultation process between a Native American tribe and a state or local agency."

4.17.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts, in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the checklist questions that address the criteria in CEQA Guidelines Appendix G. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, and the unique characteristics of the proposed Plan and EIR.

Checklist questions for TCRs are provided in Section XVIII of CEQA Guidelines Appendix G. Criterion (a)(i) addresses TCRs that are listed or eligible for listing in the CRHR, or in a local register of historical resources as defined in PRC Section 5020.1(k). Criterion (a)(ii) addresses TCRs determined to be significant by the lead agency pursuant to criteria set forth in PRC Section 5024.1 and the significance of the resource to a California Native American tribe. SANDAG has combined these checklist questions into TCR-1.

For purposes of this EIR, implementation of the proposed Plan would have a significant TCR impact if it would result in the following:

TCR-1 Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 that is either (1) listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or (2) determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1.

4.17.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

TCR-1 CAUSE A SUBSTANTAL ADVERSE CHANGE IN THE SIGNIFICANCE OF A TRIBAL CULTURAL RESOURCE, DEFINED IN PUBLIC RESOURCES CODE SECTION 21047 THAT IS EITHER (1) LISTED OR ELIGIBLE FOR LISTING IN THE CALIFORNIA REGISTER OF HISTORICAL RESOURCES, OR IN A LOCAL REGISTER OF HISTORICAL RESOURCES AS DEFINED IN PUBLIC RESOURCES CODE SECTION 5020.1(k); OR (2) DETERMINED BY THE LEAD AGENCY, IN ITS DISCRETION AND SUPPORTED BY SUBSTANTIAL EVIDENCE, TO BE SIGNIFICANT PURSUANT TO CRITERIA SET FORTH IN SUBDIVISION (c) OF PUBLIC RESOURCES CODE SECTION 5024.1

ANALYSIS METHODOLOGY

This analysis examines the impacts on TCRs that would result from implementation of the proposed Plan.

Although TCRs may differ from other types of cultural resources, cultural resources records searches and outreach to the NAHC can identify previously reported cultural resources that may be TCRs. The impact analysis is based on the NAHC Sacred Lands File search completed for the proposed Plan and AB 52 consultation conducted between SANDAG and consulting tribes. Information obtained from the NAHC, tribes, and cultural resources records searches is used to determine if cultural resources may be TCRs that are listed or eligible for listing on the NRHP, CRHR, or a local register and are present in the Plan Area; and whether the proposed Plan would cause a substantial adverse change in the significance of a TCR that is listed or eligible for listing in the NRHP, CRHR, or local register.

A substantial adverse change to the significance of a historical resource is defined as the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the cultural resource would be materially impaired (CEQA Guidelines Section 15064.5); this definition can also be applied to a substantial adverse change to a TCR.

Construction activities are more likely to disturb TCRs than operational activities because TCRs are most likely to be encountered during initial ground disturbance. For forecasted regional growth and land use change projects, as well as planned transportation network improvements, the likelihood of encountering TCRs is thus analyzed based on whether projects would require grading, excavation, or other ground-disturbing activities. Even minimal grading activities can encounter resources, as they have been discovered only inches below the surface. Ground-disturbing activities associated with infill, redevelopment, and infrastructure expansion have the potential to unearth these resources.

Impacts of operational activities on TCRs are unlikely to be significant, unless they impose a sustained change to the setting or viewshed of a TCR (thereby affecting the integrity of its setting and its significance).

2025

Regional Growth and Land Use Change

From 2016 to 2025, regional population is forecasted to increase by 161,338 people (5 percent), 97,661 housing units (8 percent), and 115,328 jobs (7 percent). The 2025 regional land use pattern is shown in Figure 2-17. Approximately 79% percent of the forecasted regional population increase by 2025 is in the City of San Diego (58 percent), City of Chula Vista (12 percent), and City of Escondido (9 percent). Those same three jurisdictions accommodate approximately 78 percent of new housing units in the region by 2025, while the City of San Diego, National City, and the City of Chula Vista accommodate more than 70 percent of new jobs in the region by 2025.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases include Downtown, Mission Valley, Midway-Pacific Highway, and University Center. The highest proportions of forecasted job increases are in the communities of Downtown, University Center, Otay Mesa, and Kearny Mesa. In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases are Otay and North County Metro. The only significant increase in jobs over that period are in East Otay Mesa.

Regional growth and land use change would result in potential impacts to TCRs resulting from a wide variety of construction and ground-disturbing activities, such as grading, excavation, and clearing, which remove or disturb soils and sediments. It is possible that buried archaeological resources meeting the definition of a TCR may be identified in relatively undisturbed open space or rural areas, such as the Otay and North County Metro communities as well as urban or developed settings.

The likelihood of encountering archaeological TCRs is greatest for projects that include grading and/or excavation of areas on which past grading and/or excavation activities have been minimal. Because archaeological sites have been found within inches of the ground surface throughout the San Diego region, even minimal grading activities can impact these resources. Excavation and soil removal of any kind, irrespective of depth, have the potential to yield archaeological TCRs. While new development and redevelopment occurring by 2025 in the region would mostly result in the intensification of previously developed areas, particularly in San Diego, Chula Vista, and Escondido, which make up the majority of growth during this timeframe, ground-disturbing activities associated with infill, redevelopment, and/or expansion of infrastructure have the potential to unearth and impact archaeological TCRs. Projects that include ground-disturbing activities in more rural or undeveloped portions of the region, such as portions of the Otay and North Valley Metro communities, may also directly impact TCRs of an archaeological nature, traditional natural resource gathering areas and sacred places.

Permanent indirect impacts from construction and operational improvements may result from potential access-related damage to TCRs when public accessibility is increased, which may happen with regional growth or land use change. The likelihood of unauthorized artifact collecting and destruction (intentional or unintentional) of TCRs of an archaeological nature, or of damage to or destruction (intentional or unintentional) of TCRs that are traditional places for gathering natural resources, cultural landscapes, or sacred places increases with ease of access. Recreational use, overland vehicle travel, and vandalism would degrade the integrity and traditional use of the TCRs. Regional growth and land use change may also impact the setting or viewshed of a cultural landscape or sacred place that may qualify as a TCR. Ensuring that appropriate measures are developed during project planning that would minimize or reduce damage to TCRs, coupled with tribal consultation, may reduce direct and indirect impacts.

Redevelopment and intensification of land uses may also result in the demolition, substantial alteration, or removal of a TCR. Adherence to the existing laws, regulations, and programs discussed in Section 4.5, and consultation with Native American tribes would avoid or reduce impacts on TCRs during construction of development projects associated with regional growth and land change, but there is no guarantee that they would reduce impacts to a less-than-significant level for all projects. Therefore, regional growth and land use change would cause a substantial adverse change in the significance of a TCR. This is a significant impact.

Transportation Network Improvements and Programs

As stated previously, numerous cultural resources have been documented in the San Diego region, some of which may be identified as TCRs during tribal consultation, and the potential exists for undocumented TCRs to be discovered. Given the region's rich cultural setting, construction of transportation network improvements included in the proposed Plan would likely encounter these resources.

Some of the improvements in the proposed Plan between 2016 and 2025 would involve only operational changes that would not require construction of new transportation or transit facilities, such as increasing service frequencies or new transit routes within existing right-of-way. These changes would generally not lead to impacts on TCRs.

However, improvements that would involve construction of new infrastructure or facilities could encounter TCRs. Highway improvements (such as lane expansions), construction of new Managed Lanes as part of the Complete Corridors program, and commuter rail upgrades as part of the Transit Leap program would require grading and other ground-disturbing activities.

Direct permanent impacts on TCRs may result from ground disturbance associated with construction, such as grading and excavation, for the planned transportation improvements stemming from the proposed Plan. The development of new transportation facilities, construction of additional lanes, or upgrades to existing facilities may have a relatively higher potential to directly impact TCRs of an archaeological nature, primarily by grading or excavation in previously undisturbed soil and by the disturbance of buried resources that have not been previously identified. Given that numerous prehistoric sites are known to exist along the shores, estuaries, lagoons, and bluffs of the San Diego coastline, grading and ground-disturbance activities along the rail corridor between Del Mar and Oceanside (for upgrades to Pacific Surfliner, COASTER, and Metrolink, for example) and I-5 from Manchester to Vandergrift in Oceanside (in order to add two new Managed Lanes, for example), have the potential to encounter archaeological resources that may meet the criteria of a TCR. TCRs could also be identified during construction of highway and road improvements such as new toll lanes on SR 11 to the Otay Mesa POE, Interchange and Arterial Operational improvements at SR 94 and SR 125, Otay Mesa Port of Entry, and more than 25 planned improvements to local arterial streets at locations throughout the region, including widenings and extensions of existing roadways, new or replaced bridges, and realignments. The potential for direct impacts on TCRs may be lower for improvements to existing facilities and modifications to existing roads because these areas have been previously disturbed. However, even if previously disturbed, excavation at depth has the potential to directly impact undocumented TCRs of an archaeological nature.

Direct impacts would be significant if TCRs cannot be avoided or preserved in place by project design or redesign and are destroyed or substantially altered. Disturbance of TCR features or places could impact the traditional use, or the cultural character and integrity, of the resource and may result in a significant impact if its contributing characteristics or the character of its physical setting is destroyed or substantially altered. Permanent direct impacts may be addressed by advance project planning and consulting with tribes that have requested consultation to ensure known TCRs are identified and avoided and preserved in place, or to develop

project alternatives that would minimize impacts on known TCRs. Permanent direct impacts on TCRs of an archaeological nature discovered inadvertently during project construction may be addressed by project redesign to avoid and preserve the TCR, and by tribal consultation focused on minimizing the impact.

Indirect impacts from construction and operational improvements may result from potential access-related damage to TCRs when public accessibility increases because of improved transportation networks stemming from the proposed Plan, for example, off-street bike trail projects that take users through open space, like the proposed San Diego River Trail Carleton Oaks Segment, or planned improvements to local arterial streets at locations throughout the region, including widenings and extensions of existing roadways. The likelihood of unauthorized artifact collecting and destruction (intentional or unintentional) of TCRs of an archaeological nature, or of damage to or destruction (intentional or unintentional) of TCRs that are traditional places for gathering natural resources, cultural landscapes, or sacred places increases with improved access. Recreational use, overland vehicle travel, and vandalism would degrade the integrity and traditional use of the TCRs. Ensuring that appropriate measures are devised during project planning that would minimize or reduce damage to TCRs, coupled with requested tribal consultation, may reduce indirect access-related impacts.

While there are State requirements in place to minimize adverse impacts on TCRs, there is still the potential for access-related damage associated with construction and operation of projects under the proposed Plan. Therefore, the potential direct regional impacts on TCRs related to the planned transportation improvements that could result in substantial alteration or removal of a TCR, and indirect impacts from access-related damage from transportation network projects and ongoing operations resulting from implementation of the proposed Plan are considered significant.

2025 Conclusion

Implementation of the proposed Plan would result in regional growth and land use change and transportation network improvements and programs that could cause a substantial adverse change in the significance of a tribal cultural resource. Therefore, this impact (TCR-1) between 2016 and 2025 is significant.

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional population is forecasted to increase by 149,500 people (4 percent), 121,650 housing units (9 percent), and 159,728 jobs (9 percent). The 2035 regional land use pattern is shown in Figure 2-18. Approximately 80 percent of the forecasted regional population increase between 2025 and 2035 is in the City of San Diego (71 percent), National City (7 percent), and City of Chula Vista (2 percent). Similarly, these three jurisdictions accommodate approximately 76 percent of new housing units and 70 percent of new jobs, respectively, between 2025 and 2035.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases include Downtown, Mission Valley, Kearny Mesa, and Midway--Pacific Highway. The highest proportions of forecasted job increases are in the communities of Downtown, Kearny Mesa, University and Otay Mesa. In the unincorporated County, the communities with the highest proportion of the forecasted population and housing unit increases include Lakeside, North County Metro and Otay. The only significant increase in jobs over that period is in Otay Mesa.

As discussed in the 2025 analysis, many areas throughout the San Diego region have a high potential to yield TCRs. In addition to the potential for identifying buried TCRs in urbanized areas of the proposed Plan, such as

Downtown San Diego, Chula Vista and National City, the additional growth forecasted in the less developed portions of the San Diego region, such as Otay and North County Metro, may occur in areas where TCRs are present. TCRs may have been previously documented as archaeological sites, cultural landscapes, areas of traditional natural resource gathering, or sacred sites, and may be identified only through future consultation with Native American tribes.

Regional growth and land use change forecasted to occur throughout the region from 2026 to 2035 would result in additional construction and ground-disturbing activities, such as excavation, grading, clearing, demolition, alteration, or structural relocation, with the potential to directly impact TCRs. Forecasted growth and land use change would also result in indirect physical impacts on rural or open space areas, and thus increase the likelihood of physical impacts on TCRs located within those areas. For instance, increased recreational use of open space areas could affect the viewshed of a TCR, or promote erosion or increase the likelihood of damage to TCRs of an archaeological nature through increased traffic (foot or otherwise). Development and ground-disturbing activities, associated with infill, redevelopment, and/or expansion of infrastructure, have the potential to impact TCRs.

As discussed in the 2025 analysis, while adherence to existing laws, regulations, and programs would reduce impacts on TCRs upon implementation of the proposed Plan, there is no assurance that they would reduce impacts to a less-than-significant level. Given the potential for land use changes to cause substantial adverse changes in the significance of a TCR coupled with the nonrenewable nature of these resources if disturbed or altered, implementation of the proposed Plan would result in ground-disturbing activities and changes in setting related to regional growth and land use change that would cause a substantial adverse change in the significance of a TCR. This is a significant impact.

Transportation Network Improvements and Programs

As discussed in the 2025 analysis, there is a rich history of Native American presence in the San Diego region; therefore, the potential for identified and unidentified TCRs to be found within transportation network improvement and program areas is high. Some of the improvements in the proposed Plan completed between 2026 and 2035 would involve only operational changes that would not require construction of new transportation or transit facilities, such as increasing service frequencies or creating new transit routes, and therefore would have little impact on TCRs. However, improvements that would involve construction of new infrastructure or facilities could encounter TCRs. Transportation construction projects such as double-tracking at certain locations on the LOSSAN rail corridor, construction of the Del Mar Tunnel, new stations at Central Mobility Hub and Camp Pendleton, Anchor Mobility Hub at the San Ysidro Transit Center and grade separation at Leucadia Boulevard, as well as numerous road projects and improvements, would require grading, and potentially trenching, activities that remove and/or disturb the upper layer of soils and could unearth underlying TCRs of an archaeological nature, areas of traditional natural resource gathering, or sacred places.

Improvements along the I-5 corridor have the potential to impact TCRs that may be present along the shores, estuaries, lagoons, and bluffs of the San Diego coastline. Direct impacts would be significant if TCRs cannot be avoided or preserved in place by project design or redesign and are destroyed or substantially altered. Additional major transportation network improvements that could impact TCRs include new Managed Lanes and Managed Lane Connectors on SR 15, SR 52, SR 94, SR 78, SR 163, SR 125, I-5, I-8, I-15, I-805. Direct Access Ramps (DARs) are assumed at: I-5/Clairemont Mesa Blvd; I-5/Voigt Drive; and SR 125/Spring St/SR 94. Shoulder widening and straightening improvements on SR 67 from Mapleview to Dye Rd, and five additional improvements to local arterial streets. These projects also have the potential to impact TCRs resulting from ground disturbance or demolition.

Disturbance of TCR features or places could impact the traditional use, or the cultural character and integrity, of the resource and may result in a significant impact if its contributing characteristics or the character of its physical setting is destroyed or substantially altered.

Indirect impacts from construction and operational improvements may result from potential access-related damage to TCRs when public accessibility increases because of improved transportation networks stemming from the proposed Plan, for example, off-street bike trail projects that take users through open space, like the proposed Oceanside Inland Rail Trail. The likelihood of unauthorized artifact collecting and destruction (intentional or unintentional) of TCRs of an archaeological nature, or of damage to or destruction (intentional or unintentional) of TCRs that are traditional places for gathering natural resources, cultural landscapes, or sacred places increases with improved access. This has the potential to degrade the integrity and traditional use of the TCRs. Ensuring that appropriate measures are devised during project planning that would minimize or reduce damage to TCRs, coupled with requested tribal consultation, may reduce indirect access-related impacts.

Given the magnitude and location of several of the transportation network improvements and programs occurring between 2026 and 2035, and the number of additional transportation network improvements over those previously implemented by 2025, additional ground disturbances are anticipated. As a result, additional TCRs would be encountered during construction activities between 2025 and 2035.

As discussed in the 2025 analysis, while adherence to the existing laws, regulations, and programs discussed in Section 4.5 would reduce impacts on TCRs upon implementation of the proposed Plan, there is no assurance that they would reduce these impacts to a less-than-significant level for all future projects. Given the potential for transportation facilities to cause substantial adverse changes in the significance of TCRs coupled with the nonrenewable nature of these resources if disturbed or altered, implementation of the proposed Plan would result in ground-disturbing activities related to transportation network improvements and programs that would cause a substantial adverse change in the significance of a TCR. This is a significant impact.

2035 Conclusion

Implementation of the proposed Plan would result in regional growth and land use change and transportation network improvements and programs that could cause a substantial adverse change in the significance of a tribal cultural resource. Therefore, this impact (TCR-1) between 2026 and 2035 is significant.

2050

Regional Growth and Land Use Change

From 2035 to 2050, regional population is forecasted to increase by 125,725 people (3 percent), 61,433 housing units (4 percent), and 164,843 jobs (8 percent). The 2050 regional land use pattern is shown in Figure 2-19. Approximately 78 percent of the forecasted regional population increase between 2036 and 2050 is in the City of San Diego (37 percent), San Marcos (13 percent), and City of Chula Vista (28 percent). Similarly, these three jurisdictions accommodate approximately 89 percent of new housing units and 72 percent of new jobs, respectively, between 2036 and 2050.

In the City of San Diego, the communities with the highest proportion of the forecasted population and housing unit increases include ~~the~~ Downtown, Midway-~~-~~Pacific Highway, and Uptown. The highest proportions of forecasted job increases are in the communities of Downtown, Otay Mesa, Kearny Mesa, and University Center~~City~~. In the unincorporated County, the communities with the highest proportion of the forecasted

population increases include Lakeside, North County Metro, and Valle de Oro. There are no housing units built in the Unincorporated area after 2035. The only significant increase in jobs over that period are in East Otay Mesa.

As discussed in the 2025 and 2035 analyses, many areas throughout the San Diego region have a high potential to contain TCRs. In addition to the resource-sensitive areas mentioned in the 2025 and 2035 analyses, the additional growth forecasted in both the unincorporated County and western portion of the region between 2035 and 2050 would result in new development in areas such as Otay, and redevelopment in established urban areas such as Downtown, Kearny Mesa, and Midway-Pacific Highway. Additional construction and ground-disturbing activities, such as such as excavation, grading, clearing, demolition, alteration, or structural relocation, would occur with the potential to directly impact TCRs. Forecasted growth and land use change would also result in indirect physical impacts on open space areas, such as in the Otay planning area, and thus increase the likelihood of physical impacts on TCRs located within those areas, as well as changes in setting. For instance, increased recreational use of open space areas could promote erosion or increase the likelihood of damage to TCRs through increased traffic (foot or otherwise). Ground-disturbing activities associated with infill, redevelopment, and/or expansion of infrastructure have the potential to impact TCRs, as do changes in setting. With additional growth and increased development intensities, and increased use of open space areas, the extent of impacts on TCRs between 2036 and 2050 would be greater than that experienced by 2025 and 2035 as more resource-sensitive land would be disturbed over time.

As more land is disturbed and altered for new development and redevelopment between 2036 and 2050, the possibility of irreversible losses of significant TCRs becomes greater. As discussed in the 2025 and 2035 analyses, while adherence to the existing laws, regulations, and programs would reduce impacts on TCRs upon implementation of the proposed Plan, there is no assurance that they would reduce these impacts to a less-than-significant level for all future projects. Given the potential for land use changes to cause substantial adverse changes in the significance of TCRs, coupled with the nonrenewable nature of these resources if disturbed or altered, implementation of the proposed Plan would result in ground-disturbing activities and changes in setting related to regional growth and land use change that would cause a substantial adverse change in the significance of a TCR. This is a significant impact.

Transportation Network Improvements and Programs

As with the 2025 and 2035 analysis, the potential exists for identified and unidentified TCRs to occur in transportation network improvement and program areas between 2036 and 2050. Projects that would involve construction of new infrastructure or facilities could result in impacts. Major rail projects and improvements such as continued double-tracking along certain LOSSAN corridor locations, construction f Sorrento Mesa and UTC tunnels and new station at Balboa Avenue, and three new commuter rail lines between Downtown San Diego and El Cajon; National City to US Border, and Central Mobility to the US Border have the potential to impact TCRs resulting from ground disturbance or demolition. Highway improvements such as Managed Lane construction along I-5, I-8, I-15, I-805, SR 52, SR 54, SR 56, SR 125, and SR 905 would require grading and, potentially, trenching activities that remove and/or disturb the upper layer of soils, and could encounter underlying archaeological TCRs. Widening and road straightening along rural highways such as SR 76, SR 78, SR 79, SR 94, and I-8 would occur in areas that have seen relatively little development and would disturb new ground. Direct impacts would be significant if TCRs cannot be avoided or preserved in place by project design or redesign and are destroyed or substantially altered. Disturbance of TCR features or places could impact the traditional use, or the cultural character and integrity, of the resource and may result in a significant impact if its contributing characteristics or the character of its physical setting is destroyed or substantially altered.

Indirect impacts from construction and operational improvements may result from potential access-related damage to TCRs when public accessibility increases because of improved transportation networks stemming from the proposed Plan, for example, off-street bike trail projects that take users through open space, like the proposed San Luis Rey River Trail. The likelihood of unauthorized artifact collecting and destruction (intentional or unintentional) of TCRs of an archaeological nature, or of damage to or destruction (intentional or unintentional) of TCRs that are traditional places for gathering natural resources, cultural landscapes, or sacred places increases with improved access. This has the potential to degrade the integrity and traditional use of the TCRs. Ensuring that appropriate measures are devised during project planning that would minimize or reduce damage to TCRs, coupled with requested tribal consultation, may reduce indirect access-related impacts.

Given the magnitude and location of several of the transportation network improvements occurring between 2036 and 2050, and the number of additional transportation network improvements over those previously implemented by 2025 and 2035, additional significant ground disturbances are anticipated. It is possible that more TCRs would be disturbed between 2036 and 2050.

As discussed in the 2025 and 2035 analyses, while adherence to the existing laws, regulations, and programs would reduce impacts on TCRs upon implementation of the proposed Plan, there is no assurance that they would reduce these impacts to a less-than-significant level for all future projects. Implementation of the proposed Plan would result in ground-disturbing activities related to transportation network improvements and programs that would cause a substantial adverse change in the significance of the resource. Given the potential for transportation facilities to cause substantial adverse changes in the significance of TCRs coupled with the nonrenewable nature of these resources if disturbed or altered, this is a significant impact.

2050 Conclusion

Implementation of the proposed Plan would result in regional growth and land use change and transportation network improvements and programs that could cause a substantial adverse change in the significance of a TCR. Therefore, this impact (TCR-1) between 2036 and 2050 is significant.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan may result in ground disturbances and increased foot activity due to construction, demolition, and increased recreational use of open spaces. These effects could result in increased erosion or disturb the upper layer of soils, unearthing underlying archaeological and historic architectural resources and causing a disturbance to buried resources. The proposed Plan could also result in an increase in development and thus impervious surfaces, which may result in increased runoff and flooding following heavy rain events, potentially damaging exposed archaeological or architectural resources. Climate change effects on cultural resources may be exacerbated by these impacts. Climate change is likely to result in increased erosion due to more wildfires, which burn vegetation and destabilize soil; more flooding, which results in runoff that increases erosion; and sea-level rise, which can worsen coastal erosion. Thus, the proposed Plan's impact on increased erosion and flooding may exacerbate climate change impacts that also increase erosion and flooding and thus affect tribal cultural resources.

MITIGATION MEASURES

TCR-1 CAUSE A SUBSTANTAL ADVERSE CHANGE IN THE SIGNIFICANCE OF A TRIBAL CULTURAL RESOURCE, DEFINED IN PUBLIC RESOURCES CODE SECTION 21047 THAT IS EITHER (1) LISTED OR ELIGIBLE FOR LISTING IN THE CALIFORNIA REGISTER OF HISTORICAL RESOURCES, OR IN A LOCAL REGISTER OF HISTORICAL RESOURCES AS DEFINED IN PUBLIC RESOURCES CODE SECTION 5020.1(k); OR (2) DETERMINED BY THE LEAD AGENCY, IN ITS DISCRETION AND SUPPORTED BY SUBSTANTIAL EVIDENCE, TO BE SIGNIFICANT PURSUANT TO CRITERIA SET FORTH IN SUBDIVISION (c) OF PUBLIC RESOURCES CODE SECTION 5024.1

2025, 2035, and 2050

TCR-1a Implement Tribal Cultural Resources Mitigation Measures for Development Projects and Transportation Network Improvements. During project-level CEQA review of development projects or transportation network improvements that would cause a substantial adverse change in the significance of a TCR, the County of San Diego, cities, and other local jurisdictions can and should, SANDAG shall, and other transportation project sponsors, can and should develop project-level protocols and mitigation measures with consulting tribes, consistent with PRC Section 21080.3.2(a) to avoid or reduce impacts on TCRs during construction and operation of development projects and transportation network improvements. The County of San Diego, cities, and other local jurisdictions can and should, SANDAG shall, and other transportation projects sponsors can and should identify these resources through records searches, survey, consultation, or other means, in order to develop minimization and avoidance methods where possible, and consult with Native American tribes participating in AB 52 consultation to develop mitigation measures for TCRs that may experience substantial adverse changes.

To assist AB 52 consultation, the County of San Diego, cities, and other local jurisdictions can and should, SANDAG shall, and other transportation project sponsors can and should comply with the following best practices for complying with AB 52:

- Get needed information in order to preserve the options of avoidance of cultural resources or preservation in place early in the planning process.
- Build working relationships with tribes that are traditionally and culturally affiliated to the project area or to the agency's geographic area of jurisdiction. In consultation, agencies should deal with officially designated representatives of the tribe who have written designation to speak on behalf of the tribe.
- Avoid inadvertent discoveries of Native American burials and work with tribes in advance to determine treatment and disposition if burials are inadvertently discovered.
- Unless the tribe agrees in writing, the project applicant or the project applicant's legal advisors, using a reasonable degree of care, should maintain the confidentiality of the information exchanged for the purposes of preventing looting, vandalism or damage to a tribal cultural resource and should not disclose the information to a third party.

In the absence of any specific mitigation measures developed during AB 52 consultation, the County of San Diego, cities, and other local jurisdictions can and should, SANDAG shall, and other transportation project sponsors can and should develop standard mitigation measures as set forth in PRC Section 21084.3 (b).

The following are standard mitigation measures for TCRs.

1. Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
2. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
    a. Protecting the cultural character and integrity of the resource
    b. Protecting the traditional use of the resource
    c. Protecting the confidentiality of the resource
3. ~~Permanent~~ Record permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
4. Protecting the resource as agreed upon during the tribal consultation process.

TCR-1b Implement Monitoring and Mitigation Programs for Development Projects and Transportation Network Improvements. During project-level CEQA review and during construction of development projects and transportation network improvements, the County of San Diego, cities, and other local jurisdictions can and should, SANDAG shall, and other transportation project sponsors can and should implement monitoring and mitigation measures to reduce impacts on both known and undiscovered TCRs, during construction and operation activities, as applicable, including but not limited to the following:

- Require TCR areas identified in any required monitoring and mitigation plan to be monitored during the grading phase of individual projects by a qualified archaeologist and tribal monitor.
- Should a previously undiscovered cultural resource be encountered during construction activities that is determined to be a TCR by the CEQA lead agency in consultation with Native American tribes, the qualified archaeologist, or tribal monitor if an archaeologist is not present, shall direct the contractor to temporarily divert all ~~stop~~ ground-disturbing activities in the area of the discovery and prepare and implement a mitigation plan consistent with standard mitigation measures set forth in PRC Section 21084.3(b), ~~in cooperation with a qualified archaeologist (if applicable) and~~ in consultation with Native American tribes.
- ~~Integrate curation of archaeological~~ The qualified archaeologist shall be responsible for ensuring that all artifacts and ~~associated~~ records associated with the survey, testing, data recovery, and/or monitoring of future projects are permanently curated with an appropriate ~~in a~~ regional center focused on the care, management, and use of archaeological collections ~~if the artifacts must be excavated~~. This shall be completed in consultation with the Native American representative and does not include Native American human remains and associated burial items, the disposition of which should be determined in consultation with the designated Most Likely Descendants (MLDs).
- Upon completion of all ground-disturbing activity, the qualified archaeologist shall prepare and submit a draft and final monitoring report to the CEQA lead agency that describes the results, analysis, and conclusions of all phases of the monitoring program, including the provisions for curation and/or repatriation, if applicable, and copies of any signed curation agreements to verify completion of the required monitoring program.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of the proposed Plan would result in significant impacts on TCRs through construction and ground-disturbing activities, and increased access to TCRs, in 2025, 2035, and 2050. Implementation of mitigation measures TCR-1a and TCR-1b would reduce impacts through the development of mitigation measures resulting from tribal consultation, regulatory compliance, and mitigation monitoring. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, this impact (TCR-1) would remain significant and unavoidable.

4.18 WATER SUPPLY

This section evaluates the water supply impacts of the proposed Plan.

4.18.1 EXISTING CONDITIONS

This section describes the general water supply conditions of both potable water and groundwater supply in the San Diego region, including local water supplies, imported water supply, desalination, and water recycling efforts. The existing conditions discussion provided below is primarily summarized from the Urban Water Management Plans (UWMPs) prepared by the applicable water supply agencies including the San Diego County Water Authority (SDCWA) and the Metropolitan Water District (MWD) (SDCWA 2021a, MWD 2021a). UWMPs have a 25-year planning horizon. The existing water supply conditions are based on the most recent available data for the San Diego region. Hydrological conditions and surface and groundwater water quality are addressed in Section 4.10, *Hydrology and Water Quality*.

METROPOLITAN WATER DISTRICT

The following information about MWD is summarized from their 2020 UWMP, dated March 2021 (MWD 2021a), unless noted otherwise. MWD is a public agency formed in 1928 for the purpose of developing, storing, and distributing water to the residents of Southern California. MWD's mission is "to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way" (MWD 2018a). MWD imports water from two sources: (1) the Colorado River water via the Colorado River Aqueduct and (2) the State Water Project (SWP) via the California Aqueduct from the Bay/Delta area in Northern California. The Colorado River aqueduct is more than 240 miles long, beginning at Lake Havasu on the Arizona/California border and ending at Lake Mathews in Riverside County. The aqueduct has the capacity to deliver up to 1.25 million acre-feet of water per year. The SWP is owned by the State of California and operated by the Department of Water Resources (DWR). The California Aqueduct, which conveys water from the SWP, is owned and operated by DWR. The SWP stretches for more than 600 miles, from Lake Oroville in the north to Lake Perris in the south. Water is stored at Lake Oroville and released when needed into the Feather River, which flows into the Sacramento River and to the Delta. The Delta is the largest estuary on the United States' west coast and is used for multiple purposes, including agriculture, recreation, and fishing, and provides the means by which to deliver water from Northern California to the south. SWP facilities provide drinking water to 23 million Californians and irrigation water for 755,000 acres of farmland (SDCWA 2021a).

MWD's service area covers nearly 5,200 square miles and includes portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. MWD serves approximately 19 million residents and is composed of 26 member agencies, including 14 cities, 11 municipal water districts, and 1 county water authority, the SDCWA. MWD's member agencies serve residents in 152 cities and 89 unincorporated communities (MWD 2016). Average daily delivery (5-year average as of December 31, 2015) is 5,000 acre-feet (MWD 2018b). An acre-foot is approximately 325,900 U.S. gallons, or roughly enough to supply 2.5 single-family households of four people for a year (SDCWA 2018a). MWD is a water wholesaler with no retail customers. To aid in planning future water needs, member agencies advise MWD of how much water they anticipate needing during the next 5 years. In addition, MWD works with its member agencies to forecast future water demand and develop emergency supply strategies to ensure a secure, long-term water supply.

SAN DIEGO COUNTY WATER AUTHORITY

The following information is summarized from SDCWA's 2020 UWMP unless noted otherwise. SDCWA was formed in 1944 and became a member of MWD in 1946 to obtain Colorado River water for the San Diego region. SDCWA's mission is to provide a "safe and reliable supply of water to its member agencies serving the San Diego region". SDCWA has 24 member agencies: 6 cities, 5 water districts, 3 irrigation districts, 8 municipal water districts, 1 public utility district, and 1 federal military agency. Its service area covers about 951,000 acres (1,486 square miles), encompassing the western third of the County, and includes approximately 3.3 million people. SDCWA's member agencies include Carlsbad, Fallbrook, Helix, Lakeside, Olivenhain, Otay, Padre Dam, Rainbow, Ramona, Rincon del Diablo, San Dieguito, Santa Fe, South Bay, Vallecitos, Valley Center, Vista, and Yuima water districts; Camp Pendleton Marine Corps Base; and the cities of Del Mar, Escondido, National City, Oceanside, Poway, and San Diego. Coronado and Imperial Beach are not within SDCWA's service area (County of San Diego 2016); however, as they obtain their water from the City of San Diego, their water consumption is included in regional water use. The supply of these two cities originates primarily from water imported by the SDCWA and provided to the City of San Diego, and secondarily from water captured in City of San Diego reservoirs.

SDCWA classifies water demand within its service area into two categories: municipal and industrial (M&I), and agricultural. The M&I demand classification includes residential demand and water used for commercial, industrial, and institutional purposes. M&I use amounts to 92 percent of water demand. SDCWA utilizes an econometric model to develop its long-range M&I demand forecasts, which is based on the U.S. Army Corps of Engineers' Municipal and Industrial Needs model and the SANDAG official growth forecasts. Agricultural demand projections are based on coordination between SDCWA, its member agencies, SANDAG, County of San Diego Agricultural Weights and Measures, and the California Avocado Commission.

As an urban water supplier, SDCWA is required to submit a complete version of its UWMP to DWR every 5 years. SDCWA prepared the 2020 UWMP in accordance with the Urban Water Management Planning Act. In addition to the 2020 UWMP, SDCWA also prepares Annual Water Supply Reports to provide updated information on development of local and imported water supplies. The 2013 Regional Water Facilities Optimization and Master Plan Update (2013 Master Plan Update) (SDCWA 2013) serves as a comprehensive evaluation of infrastructure requirements needed to ensure water supply for the SDCWA service area. The Capital Improvement Projects included in the Master Plan Update are designed to meet projected water supply and delivery needs of the member agencies through 2035. These supporting documents provide the most relevant source of baseline information for understanding existing SDCWA water supply conditions.

Table 4.18-1 shows annual regional water use (excluding recycled water) within SDCWA's service area from 2016 through 2020. Total potable water use for 2020 increased approximately 6 percent compared to the prior year.

Table 4.18-1
SDCWA Service Area Regional Water Use (acre-feet)

Year	Total Potable Water Use[1]	Municipal and Utility Water Use
2016	457,918	423,455
2017	470,275	437,346
2018	478,912	446,867
2019	429,253	407,425

Year	Total Potable Water Use[1]	Municipal and Utility Water Use
2020	457,963	432,584

Source: SDCWA 2021b.
[1] Excludes reclaimed water.

SDCWA Water Supply Sources

SDCWA supplies imported water to the San Diego region for wholesale distribution to its member agencies and is now the predominant water provider in the County, supplying 75 to 95 percent of the San Diego region's water. Historically, SDCWA has relied predominantly on imported water supplies purchased from MWD to meet the needs of its member agencies. SDCWA is MWD's largest member agency, purchasing up to 30 percent of MWD's supplies annually. Overall, imported water supplies consist of water purchases from MWD, core water transfers from the Imperial Irrigation District (IID), the All-American Canal and Coachella Canal Lining Projects, and as-needed spot water transfers to offset reduced supplies (shortages) from MWD. These imported water supplies are delivered to SDCWA's member agencies through a system of large-diameter pipelines, pumping stations, and reservoirs. In addition to imported water supplies, SDCWA began delivering regional water supplies consisting of desalinated seawater from the Carlsbad Desalination Plant in December 2015. Each of the primary sources of SDCWA's water supply is detailed further below.

Metropolitan Water District Purchases

As noted, SDCWA has relied predominantly on imported water supplies purchased from MWD, acquiring up to 30 percent of MWD's annual supplies. According to MWD's 2020 Annual Report, SDCWA purchased 322,627 acre-feet (25.4 percent) of all the water MWD delivered in fiscal year 2019–2020. Imported water supplies purchased from MWD are separate from, and supplemental to, SDCWA-IID transfer supplies and water supplies from the Coachella Canal and All-American Canal Lining Projects (MWD 2018c)

SDCWA–IID Water Conservation and Transfer Agreement

On April 29, 1998, SDCWA entered into a Water Conservation and Transfer Agreement with IID for the long-term transfer of conserved Colorado River water to the San Diego region. The Water Authority–IID Water Conservation and Transfer Agreement (Transfer Agreement) is the largest agriculture-to-urban water transfer in U.S. history. Colorado River water is conserved by Imperial Valley farmers who voluntarily participate in the program by fallowing and implementing on-farm conservation projects that conserve water, which is then transferred to SDCWA for use in the San Diego region. Additionally, the IID is developing distribution system efficiency improvements to conserve water, which are planned to increase over time as the transfer volume also increases. In October 2003, SDCWA and IID executed an amendment to the original 1998 Transfer Agreement, which modified, among other things, certain aspects of the agreement to lessen the environmental impacts of transferring conserved water. In 2015, SDCWA received 100,000 acre-feet of water from the transfer up until 2019. This increased to 192,500 acre-feet in 2020. Quantities are to increase up to 200,000 acre-feet by 2021 where it would remain for the duration of the Transfer Agreement. The initial term of the Transfer Agreement is 45 years, with a provision that allows either agency to extend it for an additional 30 years. Table 4.18-2 details the existing projected water supplies based on the current Transfer Agreement (SDCWA 2021a).

Table 4.18-2
Existing and Projected SDCWA-IID Transfer Supplies – Normal Year (acre-feet/year)

2020	2021	2025	2035	2045
192,500	200,000	200,000	200,000	200,000

Source: SDCWA 2021a.

All-American and Coachella Canals

SDCWA also has a separate, 110-year agreement to receive water conserved by lining parts of the Coachella and All-American canals in Imperial Valley. As part of the Quantification Settlement Agreement and related contracts, SDCWA receives the rights to 77,700 acre-feet per year of conserved water from these two canal lining projects. SDCWA helped fund the construction of a 37-mile lining project along the Coachella Canal and a 24-mile lining project along the All-American Canal. The concrete-lined sections replaced earthen sections and conserve water previously lost to seepage (SDCWA 2021a). The Coachella Canal Lining Project involved construction of the concrete-lined canal parallel and adjacent to the existing earthen Coachella Canal. Construction was completed in 2006, at which time 26,000 acre-feet per year of conserved water began flowing to project beneficiaries. Deliveries of conserved water to SDCWA from the Coachella Canal Lining project began in 2007 (SDCWA 2018b).

The All-American Canal Lining Project involved construction of a 24-mile concrete-lined canal parallel to the existing earthen All-American Canal. Construction was completed in 2010, when its full yield of 67,700 acre-feet per year was made available to project beneficiaries (SDCWA 2018b). The project will provide SDCWA with approximately 80,000 acre-feet of conserved water per year for 110 years. The remaining canal-lining water, 16,000 acre-feet annually, belongs to several bands of Mission Indians in the northern San Diego region and helped settle a water rights dispute with the federal government and decades of litigation (SDCWA 2018b).

The canal lining projects help SDCWA achieve its goals of water supply diversification and improved water supply reliability. SDCWA anticipates that by 2020, the canal-lining transfer would constitute 15 percent of its water supply portfolio. Over the 110-year term of the agreement, 8.5 million acre-feet are anticipated to flow to the San Diego region. Table 4.18-3 details the projected supply from the two lining projects.

Table 4.18-3
Projected Supply from Canal Lining Projects – Normal Year (acre-feet per year)

	2020	2025	2030	2035	2040	2045
Coachella Canal Lining Project	21,500	22,500	22,500	22,500	22,500	22,500
All-American Canal Lining Project	56,200	56,200	56,200	56,200	56,200	56,200
Total	**77,700**	**78,700**	78,700	78,700	78,700	78,700

Source: SDCWA 2021a.

Carlsbad Desalination Plant

Desalinated seawater is a new source of water supply in the San Diego region. Development of seawater desalination in the San Diego region creates a reliable source of water by diversifying its water resources, which in turn reduces the region's dependence on imported water supplies. Additionally, desalinated seawater is a drought-proof, locally treated water supply. In 2012, SDCWA entered into a formal Water Purchase Agreement with Poseidon Water for the purchase of desalinated ocean water produced at the Claude "Bud"

Lewis Carlsbad Desalination Plant (Carlsbad Desalination Plant) and delivered to SDCWA's regional aqueduct system. The Carlsbad Desalination Plant, located at the Encina Power Station in Carlsbad, became operational in December 2015 and provides an average of 50 million gallons per day (MGD) and up to 56,000 acre-feet per year of high-quality drinking water for the region. Of this total, 6,000 acre-feet is considered water supply directly for SDCWA's member agencies. A 10-mile-long pipeline delivers water from the plant to the SDCWA Second Aqueduct. The Second Aqueduct conveys desalinated water to the SDCWA Twin Oaks Valley Water Treatment Plant (WTP), where it is integrated with existing drinking water supplies for regional distribution. Table 4.18-4 details the projected water supply deliveries to SDCWA from the Carlsbad Desalination Plant.

Table 4.18-4
Projected Supply from Carlsbad Desalination Plant – Normal Year (acre-feet per year)

2020	2025	2030	2035	2040	2045
50,000	50,000	50,000	50,000	50,000	50,000

Source: SDCWA 2021a.

Dry-Year Water Supplies and Carryover Storage

In addition to normal year water supplies, SDCWA has a carryover storage supply program to maintain water supply reliability during dry and multiple dry years. This program includes both in-region surface water storage at San Vicente Reservoir, secured as part of the San Vicente Dam project, and out-of-region groundwater storage in California's Central Valley. Because of these storage capabilities, SDCWA can store water during wet periods for use during water supply shortages.

The San Vicente Dam Raise Carryover Storage project, located in the San Vicente Reservoir, was completed in 2014 and provides approximately 105, 563 acre-feet of local storage capacity that can be made available during water supply shortages. In addition, SDCWA's out-of-region groundwater program consists of 70,000 acre-feet of permanent groundwater storage allocation in the Semitropic-Rosamond Water Bank Authority and the Semitropic Water Bank (40,000 acre-feet and 30,000 acre-feet, respectively) in Kern County. SDCWA's assigned rights include a total Program Delivery Capacity of 12,715 acre-feet per year and 10,865 acre-feet per year of Program Pumpback Capacity.

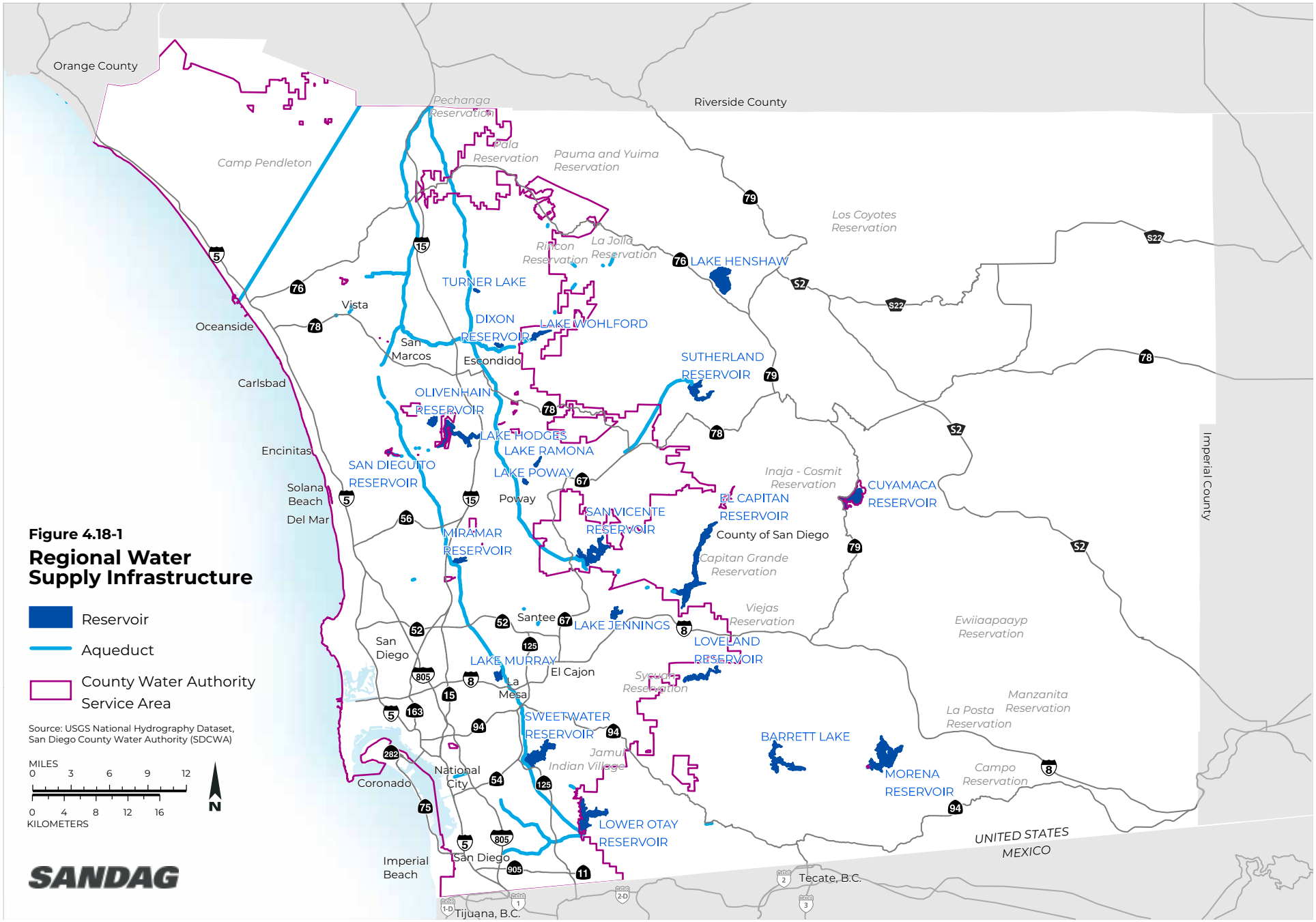
In accordance with SDCWA's Water Shortage Contingency Plan (WSCP), which guides SDCWA's water supply shortage management, use of carryover storage supplies can occur in Level 1 (Voluntary Cutbacks) and Levels 2–6 (Mandatory Cutbacks). The WSCP is discussed below.

SDCWA Member Agency Supplies

Local resources developed and managed by SDCWA's 24 member agencies are critical to securing a diverse and reliable water supply for the region. Water projects implemented at the local level help to reduce the demand for imported water and ensure a drought-resilient supply for member agencies. Member agency water supplies consist predominantly of surface water stored in reservoirs, while a small but increasing amount comes from recycled water, groundwater recovery projects, potable reuse, and desalinated seawater. A description of each of these supplies follows.

Surface Water

Surface water refers to water accumulated in local streams, rivers, and lakes from precipitation in various watersheds throughout the San Diego region. Collection and storage of local water supplies are supported by the 24 surface reservoirs located in seven of the nine coastal watersheds in the San Diego region (see Figure 4.18-1). The surface reservoirs have a combined capacity of 722,793 acre-feet. The water is placed into storage in the winter months when demand is low and pipeline capacity is available and withdrawn by the member agencies in the summer months when demand increases and pipeline capacity is restricted due to increased demands.


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
LAKE HENSHAW
TURNER LAKE
Vista
Oceanside
DIXON RESERVOIR
LAKE WOHLFORD
San Marcos
Escondido
SUTHERLAND RESERVOIR
Carlsbad
OLIVENHAIN RESERVOIR
LAKE HODGES
LAKE RAMONA
Encinitas
SAN DIEGUITO RESERVOIR
LAKE POWAY
Inaja - Cosmit Reservation
CUYAMACA RESERVOIR
Solana Beach
Poway
EL CAPITAN RESERVOIR
SAN VICENTE RESERVOIR
Del Mar
MIRAMAR RESERVOIR
County of San Diego
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Santee
LAKE JENNINGS
LOVELAND RESERVOIR
San Diego
LAKE MURRAY
El Cajon
Sycuan Reservation
La Mesa
Manzanita Reservation
La Posta Reservation
SWEETWATER RESERVOIR
BARRETT LAKE
Jamul Indian Village
National City
MORENA RESERVOIR
Campo Reservation
Coronado
LOWER OTAY RESERVOIR
UNITED STATES
MEXICO
Imperial Beach
San Diego
Tecate, B.C.
Tijuana, B.C.
Figure 4.18-1
Regional Water Supply Infrastructure
Reservoir
Aqueduct
County Water Authority Service Area
Source: USGS National Hydrography Dataset, San Diego County Water Authority (SDCWA)
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

Surface water supplies can represent the largest single local resource for SDCWA's member agencies. However, annual surface water yields can vary substantially due to fluctuating hydrologic cycles. Annual surface water yields have ranged from a low of 4,100 acre-feet in fiscal year 2015 to a high of 140,300 acre-feet in fiscal year 1984. SDCWA member agencies project average annual surface water use to increase slightly, from 44,237 acre-feet in 2020 to 44,659 acre-feet in 2045 (SDCWA 2021a). Table 4.18-5 shows the estimated average surface water supply of SDCWA's member agencies.

Table 4.18-5
SDCWA Member Agency Projected Surface Water Supply

Year	Water Supply (acre-feet per year)
2020	44,237
2025	43,957
2030	43,957
2035	44,659
2040	44,659
2045	44,659

Source: SDCWA 2021a.

Conservation

Conservation is an important resource strategy for ensuring a cost-effective reliable supply of water for the San Diego region. For the 2020 UWMP, future water conservation savings were developed for each member agency using the Alliance for Water Efficiency Water Conservation Tracking Tool, listed in DWR's 2020 UWMP Guidebook as an application to assist water purveyors in developing savings estimates (DWR 2020). Future active conservation savings are set at the 2018 level of conservation program activity moving forward, absent the recent large-scale turf replacement program and the current State Water Resources Control Board (SWRCB) State-mandated water-use reduction (SDCWA 2021a).

Potable Reuse Water

Recycled water can be further treated for potable reuse through the use of multi-barrier advanced purification treatment processes, which may include technologies such as reverse osmosis and advanced oxidation. The advanced treated water may be passed through a natural barrier, such as a groundwater basin or surface water reservoir, and provided with additional treatment to render wastewater suitable for potable purposes. Projects that include a natural barrier are considered indirect potable reuse. Projects that deliver advanced treated water directly to a raw or treated water pipeline are considered direct potable reuse.

Several SDCWA member agencies are completing studies pertaining to potable reuse in the San Diego region through groundwater recharge or reservoir augmentation. Two agencies, the City of San Diego and the Padre Dam Municipal Water District, have implemented pilot projects to determine potable reuse project viability. The City is currently developing the Pure Water Program, which is a multi-year program planned to produce 83 million gallons of purified water per day (one-third of San Diego's future drinking water supply) between 2026 and 2035. It is scheduled to be operational by 2021. The Pure Water Program will use proven water purification technology to produce safe, high-quality drinking water from treated recycled water.

Recycled Water

SDCWA works closely with its member agencies to determine the projected yield from existing and planned recycled water projects. Table 4.18-6 shows the estimated annual yield from the projects in 5-year increments based on the implementation schedules provided by the member agencies and the likelihood of development.

Table 4.18-6
Projected Recycled Water Use – Normal Year (acre-feet per year)

2020	2025	2030	2035	2040	2045
37,372	42,993	46,493	46,593	46,693	46,793

Source: SDCWA 2021a

The increase in projected recycled water use in 2020 and beyond is primarily from the expansion of existing water recycling facilities throughout the San Diego region. Recycled water development helps relieve pressure on the region's potable water supplies by providing a drought-proof, locally controlled water supply source.

The California Department of Transportation (Caltrans) is one of the largest users of recycled water in the San Diego region and is implementing a program to convert irrigation from potable water to recycled water wherever possible. Caltrans is installing water lines to bring recycled water to the Interstate (I-) 5 north coast corridor, which extends from La Jolla in San Diego to Oceanside; I-15 from Escondido to Friars Road in San Diego; State Route (SR) 52; and the eastern portion of SR 56. Caltrans also plans on expanding recycled water use in the southern part of the region on I-5, I-805 and SR 905 (Caltrans 2016).

Groundwater Supplies

The San Diego region overlies three general categories of aquifers: alluvial and sedimentary aquifers, fractured rock aquifers, and desert basin aquifers (County of San Diego 2010a). The distribution and hydrology of groundwater basins within the County of San Diego is discussed in detail in Section 4.10.

SDCWA does not currently hold groundwater basin rights, nor does it own or operate groundwater facilities within the San Diego region. However, groundwater provides an additional source of water supplies for SDCWA's member agencies. Although opportunities are limited, groundwater is currently used to meet a portion of the municipal water demands throughout SDCWA's service area from Marine Corps Base Camp Pendleton in the north to the City of National City in the south. There are several factors that limit the amount of groundwater production within SDCWA's service area, including the limited distribution of sand and gravel (alluvial) aquifers and their relatively shallow nature, lack of rainfall and associated groundwater recharge, and degraded water quality from human activities (SDCWA 2021a). Outside of the principal alluvial aquifers and farther inland, groundwater occurs in fractured crystalline bedrock and semi-consolidated sedimentary deposits where yield and storage are limited, and aquifers are best suited for lower-yielding domestic water supply wells (SDCWA 2021c).

From 2015 to 2020 (the timeframe between UWMP updates), water supply agencies within SDCWA's service area produced an annual average of approximately 22,300 acre-feet per year of potable water supplies from groundwater (SDCWA 2021a). This total includes production from both brackish groundwater desalination facilities and municipal groundwater wells. However, it does not include groundwater production from

privately owned water wells used for irrigation and domestic purposes, or groundwater produced annually from the Warner Basin by the Vista Irrigation District. Rather, this groundwater is discharged into Lake Henshaw and reported as local surface water supply by the City of Escondido and Vista Irrigation District.

In addition to providing a local supply to water agencies, groundwater is also both a primary and supplemental source of water supply for numerous private well owners, who draw on groundwater to help meet their domestic and agriculture water needs. These domestic supplies help to offset demand for imported water from SDCWA and its member agencies. However, it is difficult to accurately quantify and estimate the amount of groundwater pumped by private wells within SDCWA's entire service area (SDCWA 2021a).

While groundwater is less abundant in the San Diego region compared to other parts of the state, several water supply agencies within SDCWA's service area have identified potential projects that may provide several thousand acre-feet of additional future groundwater production. SDCWA works closely with its member agencies to develop groundwater yield projections. To be conservative, projections account for existing (verifiable) groundwater projects, which include any planned expansions to existing projects. Table 4.18-7 shows the projected annual groundwater yield from verifiable groundwater projects in 5-year increments.

4.18-7
Projected Groundwater Supply – Normal Year (acre-feet per year)

2020	2025	2030	2035	2040	2045
25,950	30,300	31,500	31,500	28,800	28,000

Source: SDCWA 2021a.
The overall increase in groundwater production from 2020 to 2040 is primarily from the recent expansion of the Richard A. Reynolds Groundwater Desalination Facility, which can now treat local groundwater supply that was previously considered non-potable or unusable.

As discussed below, the Sustainable Groundwater Management Act (SGMA) requires basins to be sustainably managed by local public agencies (e.g., counties, cities, and water agencies) that become groundwater sustainability agencies (GSAs). The main goals of the SGMA are to: (1) achieve sustainable groundwater basins, (2) enhance local management of the groundwater, and (3) establish standards for effective and continuous management of groundwater. The primary purpose of the GSAs is to develop and implement a Groundwater Sustainability Plan (GSP) to achieve long-term groundwater sustainability.

In the San Diego region, the State has designated four of the region's basins as requiring preparation of a GSP: The San Diego River Valley, San Luis Rey Valley, and San Pasqual Valley are designated as medium priority. The San Diego River Valley Basin extends from El Capitan Reservoir in the east San Vicente Reservoir in the north, and terminates just east of Mission Gorge. The San Diego River Valley Basin consists of alluvium deposited by the San Diego River and its tributaries. The San Luis Rey Valley Basin extends from the confluence of the San Luis Rey River and Paradise Creek, continuing downstream through four valleys (Pauma, Pala, Bonsall, and Mission) and ending at the Pacific Ocean in the City of Oceanside. Only the Pala and Pauma Valley portions of the basin are subject to the requirements of SGMA. The San Pasqual Valley Basin underlies San Pasqual Valley and Cloverdale, Rockwood, and Bandy Canyons in central San Diego County. Santa Ysabel, Guejito, and Santa Maria Creeks drain the valley and converge to form the San Dieguito River, which flows into Lake Hodges (County of San Diego 2018a).

The San Diego River Valley GSP is being prepared by the City of San Diego, Lakeside Water District, and Padre Dam Municipal Water District. The San Luis Rey Valley GSP is being prepared by the Pauma Community

Services District, the Upper San Luis Rey Resource Conservation District, and the Yuima Municipal Water District. The San Pasqual Valley GSP is being prepared by the City of San Diego. These GSPs are required by the SGMA to be completed by January 31, 2022 (County of San Diego 2018a).

The Borrego Valley Basin was designated as a high priority by the State due to a "critical overdraft" condition and is discussed in additional detail under *Water Supplies Outside of the SDCWA Service Area*.

SDCWA Water Supply Infrastructure and Delivery System

There are 24 surface reservoirs within SDCWA's service area, located in seven of the nine coastal watersheds in the San Diego region. Runoff in these watersheds occurs at the crest of the region's Peninsular Range and drains into the Pacific Ocean. Table 4.18-8 lists the 24 reservoirs, together with their operating agency and storage capacity. Olivenhain Reservoir, completed in 2003, is the region's newest reservoir. It is part of SDCWA's Emergency Storage Project (ESP) and has a storage capacity of 24,789 acre-feet. The ESP adds 90,100 acre-feet of additional storage capacity and is designed to protect the region from disruptions in the water delivery system.

In addition, the 2002 Regional Water Facilities Master Plan identified an opportunity to augment the ESP with a carryover storage component (CSP) at San Vicente. SDCWA completed the ESP and CSP portion of the San Vicente Dam Raise in mid-2014, which provides an additional 152,000 acre-feet of water storage capacity.

Table 4.18-8
Reservoirs in the San Diego Region

Reservoir	Operator	Usable Capacity (acre-feet)
Barrett Lake	City of San Diego	34,806
Lake Cuyamaca	Helix Water District	8,195
Dixon Reservoir	City of Escondido	2,606
El Capitan Reservoir	City of San Diego	112,807
Lake Henshaw	Vista Irrigation District	51,832
Lake Hodges	City of San Diego[1]	13,401[1]
Lake Jennings	Helix Water District	9,790
Loveland Reservoir	Sweetwater Authority	25,400
Lower Otay Lake	City of San Diego	47,067
Maerkle	City of Carlsbad	600
Miramar Lake	City of San Diego	6,682
Morena Reservoir	City of San Diego	50,694
Morro Hill	Rainbow Municipal Water District	465
Poway	City of Poway	3,432
Lake Murray	City of San Diego	4,684
Olivenhain Reservoir	Olivenhain Municipal Water District	24,774
Lake Poway	City of Poway	3,330
Lake Ramona	Ramona Municipal Water District	12,000
Red Mountain	Fallbrook Public Utility District	1,335
San Dieguito Reservoir	City of San Diego	883

Reservoir	Operator	Usable Capacity (acre-feet)
San Vicente Reservoir	City of San Diego	249,358
Sutherland Reservoir	City of San Diego	29,508
Sweetwater Reservoir	Sweetwater Authority	28,079
Turner Lake	Valley Center Municipal Water District	1,612
Lake Wohlford	City of Escondido	2,783[2]

SDCWA 2021a.
[1] The capacity accounts for the lowered reservoir level at Lake Hodges due to DWR Division of Dam Safety issues.
[2] The capacity accounts for the lowered reservoir level at Lake Wohlford due to DWR Division of Dam Safety issues.

SDCWA Water Treatment Facilities

SDCWA receives both treated and untreated water from MWD. Treated water provided by MWD is filtered at the Robert A. Skinner Treatment Plant in Hemet (Riverside County) and transported to the San Diego region for use via the First and Second San Diego Aqueducts operated by SDCWA. Untreated water received by SDCWA is treated prior to use by the public at one of the 12 water treatment facilities owned and operated by SDCWA or one of its member agencies. SDCWA owns the 100-MGD Twin Oaks Valley WTP and has agreements with the Helix Water District securing 36 MGD of treatment capacity from the R.M. Levy WTP. Water from the Levy WTP supplements treated water service to the eastern portion of the San Diego region. The balance of treated water supplies comes from WTPs owned and operated by member agencies. These water treatment facilities are listed in Table 4.18-9.

Table 4.18-9
Water Treatment Facilities within the SDCWA Service Area

Water Treatment Plant	Operator	Capacity (MGD)
Escondido-Vista WTP	City of Escondido and Vista Irrigation District	75
Robert A. Weese Filtration Plant	City of Oceanside	25
Lester J. Berglund WTP	City of Poway	24
Miramar WTP	City of San Diego	140
Alvarado WTP	City of San Diego	150
Otay WTP	City of San Diego	34
R.M. Levy WTP	Helix Water District	106
David C. McCollom WTP	Olivenhain Municipal Water District	34
R.E. Badger Filtration Plant	Santa Fe Irrigation District	40
Twin Oaks Valley WTP	San Diego County Water Authority	100
Robert A. Perdue WTP	Sweetwater Authority	30

Source: SDCWA 2021a.
MGD = million gallons per day; WTP = Water Treatment Plant

SDCWA Water Storage Contingency Plan

The WSCP (SDCWA 2020) provides an overview of SDCWA's actions to increase the region's water supply reliability and to outline the response to drought or other water shortage emergencies. It builds upon previous planning documents as well as the experience gained in two previously declared droughts in this century. A review of historic drought periods is presented along with SDCWA's actions and lessons learned during those periods. Annual water supply and demand assessment is summarized. Six regional water shortage response

actions and levels are presented, including actions required at each level and the water supply conditions that trigger the response levels. Extraordinary Demand Reduction Measures are identified. These include a list of potential consumer water use restrictions and extraordinary measures to reduce demands during shortage events. A detailed methodology for allocation of supplies to member agencies in a water supply shortage is presented. A description of how SDCWA would manage catastrophic water shortages caused by an event such as an earthquake is outlined.

WATER SUPPLIES OUTSIDE OF THE SDCWA SERVICE AREA

The rural, eastern portion of the San Diego region is outside the SDCWA service area and completely dependent on local groundwater for water supply. Geographically, the majority of the unincorporated area (65 percent) located roughly within and east of the Palomar and Cuyamaca mountains is reliant upon either separate groundwater-dependent districts or private wells that are unaffiliated with SDCWA. Groundwater is derived from onsite private wells, small community water systems, or private water companies. According to forecasts, as of 2016, there were 95,171 county residents outside of the SDCWA service area. Regardless of the responsible provider, all of these areas are entirely reliant on groundwater and as such are subject to its availability. Table 4.18-10 provides a list of water supply providers outside of the SDCWA service area.

Several of these districts are not required to prepare UWMPs because they either do not serve over 3,000 customers or do not distribute over 3,000 acre-feet of water annually (County of San Diego 2011).

The County of San Diego conducted a groundwater study as part of the 2011 General Plan Update (County of San Diego 2010a). The study area encompassed approximately 1,885 square miles of land, which is entirely groundwater dependent. The study area is bounded by Riverside County to the north, the international boundary with the Republic of Mexico to the south, San Diego County unincorporated and incorporated land served by the SDCWA member agencies to the west, and desert basin aquifers and Imperial County to the east. It consists of nine hydrologic units within the San Diego Hydrologic Region and three hydrologic units within the Colorado Hydrologic Region.

The study identified the following areas as having the potential for localized groundwater problems (especially at the height of extended drought periods) from pumping large amounts of groundwater: (1) Ballena Valley, located east of Ramona, (2) Guatay located in the Cuyamaca Mountains, (3) Julian Town Center, (4) and Morena Village, located northwest of Campo. Thirteen basins were identified as having a potentially significant impact on groundwater resources at maximum build-out of the proposed General Plan Update. The study also determined that the Borrego Springs Park Community Services District and Borrego Water District would have inadequate water supply to serve their service area (County of San Diego 2010a).

Table 4.18-10
Water Supply Agencies Outside the SDCWA Service Area

Water Supply Provider	Community Served	Source
Borrego Water District	Anza Borrego and Borrego Springs	Local groundwater supply and sole source aquifer[1]
Borrego Springs Park Community Service District *	Borrego Springs	Local groundwater supply
Campo Water Maintenance District*	Campo	Local groundwater supply

Water Supply Provider	Community Served	Source
Canebrake County Water District	Anza Borrego, seasonal visitors and part-time residents	Local groundwater supply
Cuyamaca Water District*	Cuyamaca	Local groundwater supply
Descanso Community Service District*	Descanso	Local groundwater supply
Jacumba Community Services District*	Jacumba	Local groundwater supply
Julian Community Service District *	Julian	Local groundwater supply
Live Oak Springs Water Company	Boulevard	Local groundwater supply
Majestic Pines Community Service District*	Julian	Local groundwater supply
Mootamai Municipal Water District*	Pala-Pauma	Local groundwater supply
Pauma Municipal Water District*	Pala-Pauma	Local groundwater supply
Pine Hills Mutual Water Company*	Julian/Pine Hills	Local groundwater supply
Pine Valley Mutual Water Company*	Pine Valley	Local groundwater supply
Questhaven Municipal Water District*	San Dieguito	Local groundwater supply
Rancho Pauma Mutual Water Company*	Pala-Pauma	Local groundwater supply
San Luis Rey Municipal Water District*	Fallbrook, Valley Center, Pala-Pauma	Local groundwater supply
Wynola Water District*	Julian/Wynola	Local groundwater supply

Source: County of San Diego 2011, 2021.
[1] A sole source aquifer is an underground water supply designated by the U.S. Environmental Protection Agency as the "sole" or "principal" source of drinking water for an area.
* Denotes Water Supply Providers that either do not serve over 3,000 customers or do not distribute over 3,000 acre-feet of water annually and are therefore not required to have a UWMP.

Borrego Valley Groundwater Subbasin

Desert basins account for approximately 14 percent of the unincorporated area of the San Diego region, and are located in its easternmost portions. These basins are characterized by extremely limited groundwater recharge but large storage capacity. When groundwater extraction exceeds recharge the result is an overdraft condition that is not sustainable (County of San Diego 2010a). The Borrego Valley Groundwater Basin has a well-documented groundwater overdraft condition. In 2016, the DWR subdivided the Borrego Valley Groundwater Basin into two separate subbasins, the Borrego Springs Groundwater Subbasin and the Ocotillo Wells Groundwater Subbasin (DWR 2016b). The Borrego Springs Subbasin covers an area of approximately 98 square miles, and the Ocotillo Wells Groundwater Subbasin covers an area of approximately 141 square miles (of which approximately 44 percent is located within San Diego County; the remainder of the Ocotillo Wells Groundwater Subbasin is located in Imperial County).

Current groundwater use in the Borrego Springs Groundwater Subbasin greatly exceeds groundwater recharge, and the Subbasin is designated by the DWR as high priority and critically overdrafted (Borrego Valley Groundwater Sustainability Agency [BVGSA] 2019). The Coyote Creek, Upper San Felipe Creek, and the Borrego Valley-Borrego Sink Wash watersheds drain to the Borrego Springs Subbasin and provide the majority of recharge for the subbasin. Due to its arid climate, the Borrego Springs Subbasin receives limited precipitation, and is remote for potential sources of imported water. The Borrego Springs Subbasin holds a large amount of groundwater in storage, estimated in 2016 to be approximately 1.5 million acre-feet of usable groundwater (BVGSA 2019). Water levels have been declining for decades because of the overdraft condition, and groundwater production at current rates is not sustainable. Groundwater withdrawal through pumping has

exceeded the amount of water that has been replenished, causing groundwater level declines of 2 feet per year in wells in the northern part of the valley, where groundwater is intensively pumped for irrigation agriculture (USGS 2015). Over the past 65 years, groundwater levels have declined as much as 126 feet in the northern portion and by approximately 87 feet in the west-central portion of the subbasin. Less groundwater has been pumped in the southeastern part of the subbasin, and groundwater levels have remained relatively stable in this portion of the subbasin. While the majority of residences and commercial entities in Borrego Valley receive their water from the Borrego Water District (BWD), some private property owners within the BWD service area use private wells that rely on groundwater extracted from the Borrego Spring Subbasin. The vast majority of the water supplied to agricultural users within Borrego Valley comes from privately owned wells within the BWD service area (County of San Diego 2010b).

In order to comply with the Sustainable Groundwater Management Act (see Regulatory Setting below) efforts began in 2017 to prepare a GSP for the Borrego Springs Subbasin. A public input process was conducted and a draft GSP prepared and circulated. Ultimately, the BWD filed a lawsuit seeking a comprehensive adjudication of groundwater rights in the subbasin (JND Legal Administration, 2021). A Settlement Agreement to adjudicate groundwater rights, was approved on April 8, 2021 (see *Borrego Water District v. All Persons who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin No. 7.024-01 Whether Based on Appropriation, Overlying Right, or Other Basis Of Right, and/or Who Claim a Right to use of Storage Space in the Subbasin*). Under the terms of the Settlement Agreement, all parcels within the Borrego Water District will be metered to measure water use. All users will be required to ratchet down by 5 percent each year the amounts of water they take from the aquifer. By 2030, all will have halved their baseline amounts, and by 2040 groundwater and thereafter withdrawal will be reduced by 74 percent. From that time forward groundwater withdrawal will match basin recharge (JND Legal Administration 2021).

ANTICIPATED EFFECTS FROM CLIMATE CHANGE

The San Diego region is likely to experience sea-level rise of up to 1.2 feet by 2050 and up to 4.6 feet by 2100, wetter winters and more intense precipitation that can lead to increased flooding, a 12 percent decrease in runoff and streamflow due to less snowpack and greater evaporation, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix C.

Climate change may have an impact on both imported and local water supplies for the San Diego region. Imported supply could be reduced by changes in snowpack and snowpack melt (which would affect the timing of water availability), less precipitation, increased evaporation from higher temperatures, and saltwater intrusion due to sea-level rise. Meanwhile, demand could be increased due to evapotranspiration and drought.

Effects such as reduced snowpack and precipitation, as well as more precipitation falling as rain rather than snow in the mountains, can decrease water supplies coming from the mountain ranges. These effects reduce the amount of runoff and streamflow from melted snow, potentially decreasing this source of water. Such changes have already affected the Colorado River, which has seen a decline in streamflow by 16.5 percent between 1916 and 2014; over half of this decline can be attributed to warming temperatures (Xiao et al. 2018). A shift in the timing of melting snowpack can also affect supplies (CEP and SDF 2015). This snowpack usually melts in the spring and summer, releasing water when it is most needed; however, snow has melted earlier in recent years, reducing the amount of water available later in the year (Reidmiller et al. 2018). By 2100, snow water equivalent is expected to decline to less than one-half of its historical average under Representative

Concentration Pathways (RCP) 4.5 and less than one-third of the historical average under RCP 8.5 (Bedsworth et al. 2018).

The San Diego region does draw from mountain water, as SDCWA bought 40 percent of its water from MWD in 2017 (SDCWA 2016). MWD draws from the Sierra Nevada mountain range and the Colorado River, which is also supplied by mountain water.

Other impacts of climate change, such as reduced precipitation, increased evaporation, and increased drought, can also make some water sources drier. These changes would affect the Colorado River (CEP and SDF 2015), State Water Project, groundwater supply, and other surface water sources (SDF 2008).

Sea-level rise could result in saltwater intrusion along coastline water sources. Saltwater intrusion degrades freshwater supply, decreasing the amount of drinking water available to the San Diego region. Saltwater intrusion would affect the Bay-Delta (Kibel 2015), which MWD also sources from, as well as groundwater wells located along the coast (USGS n.d.).

Future water supplies are also vulnerable to impacts of climate change, although the San Diego region plans on diversifying its water portfolio, and it is unknown what the net impact will be. SDCWA plans on reducing its reliance on MWD sources to 2 percent of its supplies by 2035. However, the other two imported water sources that feed the San Diego region (the Imperial Irrigation District Transfer and the All American & Coachella Canal Lining, which made up 38 percent of the region's water supplies in 2017 and will constitute 45 percent of the supply by 2035) still originally source their water from the Colorado River (SDCWA 2016).

Part of the future water supply plan also includes increasing reliance on local water supplies, from 22 percent in 2017 to 51 percent in 2035 (SDCWA 2016). The increase in extraction from groundwater, one local supply, may result in subsidence, permanently reducing availability of groundwater supply (Melillo et al. 2014). Other supplies, such as seawater desalination, consume large amounts of energy, a resource that may also be compromised by climate change (Kelley 2011). The largest-growing water supply that the County plans on drawing from is potable reuse, from 0 percent in 2017 to 17 percent by 2035 (SDCWA 2016). Little research exists on the effects of climate change on potable reuse, so the impact this will have on the San Diego region's water supply is unknown.

Climate change impacts such as drought and evapotranspiration may increase agricultural water demand due to increased irrigation to make up for lack of rainfall and to adjust to higher temperatures. Christian-Smith et al. (2012) forecasted a 10 percent increase in urban demand due to climate change by 2055 in California under a medium-to-high emissions scenario, without water conservation strategies. Because many water distributors across California other than SDCWA also buy from MWD, this statewide increase in demand could put stress on water supplies. In the San Diego region specifically, the demand totaled 463,128 acre-feet in 2020, while the demand forecasted in 2035 will total 632,000 acre-feet under RCP 8.5,[1] having increased from a combination of population growth, rising temperatures, and more drought and evaporation (SDCWA 2016, SDCWA 2021a). This increase in demand may come from all sectors (though residential use dominates), where higher temperatures, drought, and evapotranspiration may require various operations to source more water

[1] Representative Concentration Pathway 8.5 is the IPCC greenhouse gas concentration trajectory that assume a "business as usual" scenario where greenhouse gas emissions continue to rise throughout the twenty-first century.

(Christian-Smith et al. 2012). However, the exact increases in water demand in the region resulting from climate change are not known.

4.18.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Safe Drinking Water Act

The Safe Drinking Water Act (42 U.S. Code Sections 300(f) et seq.) gives the U.S. Environmental Protection Agency (EPA) the authority to set drinking water standards (40 Code of Federal Regulations 141.1 et seq.). Drinking water standards apply to public water systems, which provide water for human consumption through at least 15 service connections, or regularly serve at least 25 individuals. There are two categories of drinking water standards, the National Primary Drinking Water Regulations (NPDWR) and the National Secondary Drinking Water Regulations (NSDWR). The NPDWR are legally enforceable standards that apply to public water systems. NPDWR standards protect drinking water quality by establishing maximum contaminant levels for specific drinking water contaminants that present a risk to human health. The NSDWR set non-mandatory water quality standards for 15 contaminants that are not considered to present a human health risk (EPA 1974).

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

Department of Water Resources California Water Plan Update 2018

The California Water Plan (CWP) is "the State's strategic plan for sustainably managing and developing water resources statewide for current and future generations" (DWR 2019). The update provides recommended actions, funding scenarios, and an investment strategy to bolster efforts by water and resource managers, planners, and decision-makers to overcome California's most pressing water resource challenges. The update builds on progress made in the CWP Update 2013 and contains six goals for sustainability: (1) improving integrated watershed management; (2) strengthening resiliency and operational flexibility of existing and future infrastructure; (3) restoring critical ecosystem functions; (4) empowering California's under-represented or vulnerably communities; (5) improving inter-agency alignment and addressing persistent regulatory challenges; and (6) supporting real-time decision-making, adaptive management, and long-term planning.

California Water Resilience Portfolio

The California Water Resilience Portfolio (CNRA 2020) was developed in response to Governor Newsom's Executive Order N-10-19, which directed State agencies to develop recommendations to meet water needs through the 21st century and enable water security for all Californians. State agencies developed the California Water Resilience Portfolio to improve California's capacity to prepare for disruptions, withstand and recover from climate-related shocks, and adapt into the future. The portfolio embraces a broad, diversified approach, with four categories of goals and actions: (1) maintaining and diversifying water supplies; (2) protecting and enhancing natural ecosystems; (3) improving physical infrastructure to store, move, and share water more flexibly and integrate water management; and (4) preparing for new threats. The portfolio recognizes that water resilience will be achieved with local, regional and tribal leadership, on a region by region basis, considering the unique challenges and opportunities in each area. The portfolio includes more than 100 detailed actions to ensure California water systems work for our communities, our economy, and our environment, which will be implemented based on priority and to the extent resources are available.

SWRCB Emergency Conservation Regulations

On January 17, 2014, Governor Brown issued a proclamation of a state of emergency under the California Emergency Services Act based on drought conditions. In April 2017, the Governor partially ended the drought State of Emergency in most of California, while maintaining water reporting requirements and prohibitions on wasteful practices such as watering during or right after rainfall, hosing off sidewalks, and irrigating ornamental turf on public street medians (SWRCB 2019).

Executive Order B-37-16 and B-40-17

On May 9, 2016, Governor Brown issued Executive Order B-37-16, calling for the SWRCB to adjust emergency water conservation regulations through the end of January 2017 in recognition of the differing water supply conditions across the state. Executive Order B-40-17 builds on actions taken in Executive Order B-37-16, which remains in effect, to continue making water conservation a way of life in California. The long-term conservation framework includes recommendations to establish permanent water conservation standards and improved agricultural and urban water management planning to better prepare for more frequent and severe droughts due to climate change.

Regulations Related to Recycled Water

Under Code of California Regulations Title 22, the State Department of Public Health established statewide effluent bacteriological and treatment reliability standards for recycled water uses. (On July 1, 2014, the State's Drinking Water Program was transferred to the SWRCB.) The standards are based on the potential for human contact with recycled water. Each of California's nine Regional Water Quality Control Boards (RWQCBs) has established and enforces requirements for the application and use of recycled water. Permits are required from the RWQCB for any recycling operation. Applicants for a permit are required to demonstrate that the proposed recycled water operation is in compliance with Title 22 and will not exceed the ground and surface water quality objectives in the regional basin management plan. In the San Diego region, the basin management plan is the Water Quality Control Plan for the San Diego Basin 9 prepared and administered by the San Diego RWQCB.

The Water Conservation Act of 2009

The Water Conservation Act of 2009 (Senate Bill [SB] x7-7 of 2009) sets water conservation targets and efficiency improvements for urban and agricultural water suppliers. The legislation establishes a statewide target to reduce urban per capita water use by 20 percent by 2020. Urban retail water suppliers are required, individually or on a regional basis, to develop an urban water use target by December 31, 2010, to meet their target by 2020, and to meet an interim target (half of their 2020 target) by 2015. Urban water suppliers cannot impose conservation requirements on process water (water used in production of a product) and are required to employ two critical efficient water management practices—water measurement and pricing. Urban retail water suppliers were required to complete water management plan to include information such as the baseline daily per capita water use, water use target, interim water use target, and compliance daily per capita water use. Effective in 2016, urban retail water suppliers who did not meet the water conservation requirements established by this bill were not eligible for State water grants or loans (DWR 2009).

2018 Water Conservation and Drought Planning Legislation

SB 606 and AB 1668 of 2018 (Chapters 14 and 15, Statutes of 2018) modify several provisions of the Water Conservation Act of 2009. These bills call for creation of new urban efficiency standards for indoor use, outdoor

use, and water lost to leaks, as well as any appropriate variances for unique local conditions. The SWRCB is required to adopt these standards by regulation no later than June 30, 2022. The indoor water use standard is required to be 55 gallons per capita per day (GPCD) until January 2025, decreasing to 50 GPCD in January 2030. Each urban retail water agency is required annually, beginning November 2023, to calculate its own water use objective, using SWRCB standards and based on the water needed in its service area, for efficient indoor residential water use; outdoor residential water use; commercial, industrial and institutional irrigation; and other uses. In addition, AB 1668 creates additional requirements for agricultural water management plans originally required by the Water Conservation Act of 2009.

California Urban Water Management Planning Act

The California Urban Water Management Planning Act (Water Code Part 2.6) states that each urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, should make every effort to ensure the appropriate level of reliability in its water service is sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years by preparing a UWMP and updating it every 5 years. The last required UWMP updates were completed in 2021. The California Urban Water Management Planning Act describes the contents of UWMPs, and requires each agency's UWMP to assess the reliability of the agency's water resources over a 20-year planning horizon.

SB 606 of 2018 created additional requirements for UWMPs, including preparation of a drought risk assessment and a water shortage contingency plan. It also requires urban water suppliers conduct an annual water supply and demand assessment, and submit an annual water shortage assessment report to DWR.

Water Supply Planning

SB 610 (Chapter 643, Statutes of 2001) and SB 221 (Chapter 642, Statutes of 2001) improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 requires local public water providers with more than 3,000 service connections to prepare a Water Supply Assessment (WSA) for any project that is subject to CEQA and meets specified minimum size criteria.

For qualified projects, the WSA must document sources of water supply, quantify water demands, and compare future water supply and demand to show that sufficient water will be available to serve the project. Water supply must be assessed for normal, single dry, and multiple dry water years during a 20-year forecast. If supplies are found to be insufficient to serve the project, the WSA must include plans for acquiring sufficient supplies. The WSA must be included in the CEQA document for the project.

SB 221 (Chapter 642, Statutes of 2001) applies to subdivisions of more than 500 dwelling units. Like SB 610, it is intended to ensure an adequate water supply for new development is available. SB 221 requires that approval of a tentative map include a requirement that a sufficient water supply is available. Government Code Section 66473.7(k) contains special provisions for SB 221 compliance in the San Diego region.

California Groundwater Management Act

The Groundwater Management Act (Water Code Section 10750 et seq.) provides guidance for applicable local agencies to develop voluntary groundwater management plans (GMPs) in State-designated groundwater basins. GMPs can allow agencies to raise revenue to pay for measures influencing the management of the basin, including extraction, recharge, conveyance, facilities' maintenance, and water quality. The Sustainable Groundwater Management Act (see below) prohibited new GMPs from being adopted or an existing GMP from being renewed, beginning January 1, 2015.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (Chapters 346, 347, and 348, Statutes of 2014) encompasses three bills: Assembly Bill (AB) 1739, SB 1168, and SB 1319 of 2014. The Act focuses on the importance of local action in order to achieve groundwater sustainability and allow local agencies to tailor sustainable groundwater plans to their own economic and environmental needs. The Act created a timeline for its implementation: by 2017, local groundwater management agencies were identified; groundwater sustainability plans must be adopted for basins designated as high- or medium-priority currently being over-drafted by January 31, 2020; groundwater sustainability plans must be adopted for all other high- and medium-priority basins by January 31, 2022; and by 2040 all high- and medium-priority groundwater basins must achieve sustainability. SWRCB has the authority to intervene in sustainability plan preparation if deadlines are not met by local agencies.

The formation of groundwater management agencies results in the monitoring of well water pumping from the managed aquifer along with the calculation of a sustainable yield. Once a sustainable yield has been determined, a basis exists for a groundwater trading program that allows users to purchase or lease the rights of other users while staying within the overall withdrawal limits set by the groundwater sustainability plan.

The Sustainable Groundwater Management Act is meant to stop over-drafting of groundwater supplies and to reduce the potential of groundwater contamination by salt water infiltration. It aims to supply California with a reliable water source for the future (DWR 2018c).

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

Both MWD and SDCWA have developed plans that address long-term water supply and demand, as well as catastrophic supply interruption and emergency storage. These plans, as they relate to the issues in this EIR, are described below.

MWD Integrated Water Resources Plan, 2015 Update

Developed in collaboration with all of MWD's member agencies, MWD's Integrated Water Resources Plan (MWD 2015) adopts an "adaptive integrated resources management strategy." A number of uncertainties could affect future water supply: climate change, cost and use of energy, potential policy and permitting restrictions, endangered species protections, and demographic unknowns. To achieve maximum supply reliability in a cost-effective and adaptive manner, MWD will rely on the following main management components to build on existing supplies:

- Stabilizing and maintaining imported supplies.
- Meeting future growth through increased conservation and existing and new local supplies.
- Pursuing a comprehensive transfers and exchanges strategy.
- Building storage in wet and normal years to manage risks and drought.
- Preparing for climate change with Future Supply Actions – recycled water, seawater desalination, stormwater capture and groundwater cleanup.

MWD Regional Urban Water Management Plan

The 2015 MWD UWMP was prepared in compliance with Water Code Sections 10608.36 and 10610 through 10656 of the Urban Water Management Planning Act. Information in MWD's 2015 UWMP may be used by local water suppliers in preparation of their own UWMP and represents current available planning projections of supply capability and demand. The UWMP describes MWD's planning activities and explains how the agency will manage the region's water resources to ensure a reliable water supply for the region. The UWMP also addresses the issue of water quality and steps taken to deliver high-quality water to MWD's service area (MWD 2016).

SDCWA Urban Water Management Plan and Water Use Efficiency Programs

SDCWA's 2020 UWMP presents strategies designed to enhance water supply reliability through diversification of water sources, compliance with Water Conservation Act of 2009 conservation targets, and improvement of supply and delivery infrastructure. Some of the more prominent strategies are the All-American Canal and Coachella Canal Lining Projects, development of a regional seawater desalination plant located in Carlsbad (SDCWA 2016), construction of the San Vicente Dam Raise and Carryover Storage Project, and supporting the development of additional local supplies. Combined with strategies are SDCWA's outreach efforts to raise public awareness of growing water supply and water rate challenges and increased long-term residential, commercial, and public sector water use efficiency. The 2020 UWMP is based on SANDAG's Series 14 Regional Growth Projections.

Additionally, SDCWA's Water Use Efficiency Policy Principles include how SDCWA may implement and administer regional water use efficiency projects and programs where economies of scale, geography considerations, or other member agency circumstances make a regional program more efficient or cost-effective. The principles also provide additional direction to staff regarding efficiency projects or programs affecting SDCWA, its member agencies, and/or regional water management and use. The principles include policies pertaining to member agency support, funding and resources, program performance, outreach and education, and regulation and legislation.

San Diego Integrated Regional Water Management Plan

The 2019 San Diego Integrated Regional Water Management Plan (IRWMP) presents an integrated approach for addressing water management issues in the San Diego region (IRWMP 2019). The 2019 San Diego IRWMP focuses on five goals:

- Improve the reliability and sustainability of regional water supplies.
- Protect and enhance water quality.
- Protect and enhance our watersheds and natural resources.
- Enhance the resiliency to climate change for local water resources.
- Promote and support sustainable integrated water resource management.

SDCWA Regional Water Facilities Optimization and Master Plan Update

SDCWA's Regional Water Facilities Optimization and Master Plan Update (Master Plan Update) (SDCWA 2013) is a comprehensive evaluation of infrastructure requirements needed to meet SDCWA's mission of providing a safe and reliable water supply to its member agencies. It is based on projections for future water demands

and water supplies from the 2010 UWMP. The Master Plan Update identifies projects needed to ensure reliability and ability to serve projected water demands to 2035. Projects include expanded water conveyance facilities, new water storage facilities, upgraded pump stations, and pipeline relining.

Local Urban Water Management Plans and Water Use Efficiency Programs

The California Urban Water Management Planning Act (Water Code Part 2.6) requires each of SDCWA's 24 member agencies to prepare a UWMP to support long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. SDCWA's member agencies' UWMPs reflect and are coordinated with SDCWA's UWMP. Local agencies with a UWMP include the City of Carlsbad, the City of Escondido, the Fallbrook Public Utility District, Helix Water District, Lakeside Water District, the City of Oceanside, Otay Water District, Rainbow Municipal Water District, Rincon Del Diablo Municipal water District, Ramona Municipal Water District, the City of San Diego, San Dieguito Water District, Santa Fe Irrigation District, Sweetwater Authority, Valley Center Municipal Water District, Vallecitos Water District, Vista Irrigation District, Rainbow Municipal Water District, the City of Poway, Olivenhain Municipal Water District, and Padre Dam Municipal Water District (DWR 2018c).

SDCWA also runs a water conservation program known as WaterSmart, which is implemented by SDCWA member agencies. The online program offers various resources, programs, and incentives for residences, businesses, Home Owner Associations, and agricultural use management programs, as well as information for teachers and students, WaterSmart tips, eGuides, and rebate offers (SDCWA 2018d).

San Diego County Groundwater Ordinance

The County Groundwater Ordinance states that a project listed in Section 67.711 (Application) of the Ordinance that will extract or use at least 1 acre-foot (325,851 gallons) of groundwater per year shall include one or more groundwater use reduction measures, identified in the Ordinance. The groundwater use reduction measures shall fully offset the amount of groundwater that the proposed project will use and shall result in "no net increase" in the amount of groundwater extracted (County of San Diego 2013).

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

In 2020, the BVGSA adopted the Borrego Springs Groundwater Sustainability Plan (GSP), which established criteria that will maintain or achieve sustainable groundwater management of the Borrego Springs Subbasin. The GSP contains a summary of the Borrego Springs Subbasin setting and overdraft conditions; it establishes sustainability indicators, minimum thresholds, and measurable objectives for the Subbasin; and establishes project and management actions to reduce water demand within the Subbasin and maintain water quality suitable for current and future beneficial uses. The Borrego Springs GSP establishes a sustainability goal to halt the overdraft condition in the Subbasin by bringing the groundwater demand in line with a sustainable yield of 5,700 acre-feet per year by 2040, while stabilizing or improving groundwater levels (BVGSA 2019). BWD filed suit seeking an adjudication of groundwater rights within the subbasin. Under the terms of a Settlement Agreement approved on April 8, 2021, the sustainability goals of the Borrego Springs GSP were implemented.

Recycled Water Regulations

The County Department of Environmental Health regulates the use of recycled water through a delegation agreement with the State of California. The purpose is to protect the public from health risks associated with cross-connections of recycled water and drinking water supplies, as well as to prevent health risks from body contact with recycled water. The department's Land and Water Quality Division reviews recycled water use

plans and conducts site inspections to ensure drinking water supplies are not contaminated with recycled water. Spray irrigation sites are monitored to ensure the recycled water irrigation does not present a risk to the public. Recycled water sites must also pass a cross-connection control shutdown test when installed and every 4 years after installation (County of San Diego 2018b).

The City of San Diego maintains the policy that recycled water be used for any purpose approved for recycled water use when it is economically, financially, and technically feasible, as mandated by Ordinance 0-17327 (City of San Diego 2008). The policies regarding recycled water use are documented in the Rules and Regulations for Recycled Water Use and Distribution within the City of San Diego (2008), which lists the following goals:

- Prevent direct human consumption of recycled water through adherence to all applicable rules and regulations and laws which include a strict cross-connection/backflow prevention program.
- Prevent cross-connection between recycled and potable water systems.
- Isolate contamination by other sources, such as wastewater, sludge, urban runoff, or other substances which may come into contact with the recycled water.

In addition to the County regulations, the City of Escondido's Recycled Water Master Plan (City of Escondido 2011), summarizes the City's Recycled Water Service Rules and Regulations for Recycled Water Use. The San Dieguito Water District's Recycled Water Rules and Regulations govern the requirements for recycled water use within the District's jurisdiction (City of Encinitas 2011). The Fallbrook Public Utility District Administrative Code, Article 28, describes the District's Recycled Water Program (FPUD 2010). Olivenhain Municipal Water District's Rules and Regulations Governing the Use of Recycled Water describes the facility requirements, recycled water services, and operational requirements in the jurisdiction (OMWD 2015). In 2002 the Rincon del Diablo Municipal Water District revised their Recycled Water Service Rules, Regulations, and Project Guidelines (RDDMWD 2018).

4.18.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for evaluating the significance of a project's environmental impacts on water supply, in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the checklist questions in CEQA Guidelines Appendix G. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, and the unique nature of the proposed Plan.

Checklist questions for water supply are included in Sections IX (b and e) and XIX (a and b) of Appendix G. Because of the importance of water supply issues in the San Diego region and throughout California, this EIR addresses the water supply impacts of the proposed Plan in a stand-alone section. For purposes of this EIR the Appendix G questions have been combined and modified. Specifically, Appendix G Section XIX (b) regarding sufficient water supplies is addressed in criterion WS-1. Section IX questions (b) and (e) regarding groundwater supplies and sustainable groundwater management plans are addressed in criterion WS-2. Section XIX question (a) regarding the relocation or construction of new or expanded water facilities is addressed in criterion WS-3. For the purposes of this EIR, the proposed Plan would have a significant water supply impact if it would:

WS-1 Not have sufficient water supplies available to serve the projected regional demand during normal, dry and multiple dry years.

WS-2 Substantially decrease groundwater supplies, or interfere substantially with groundwater recharge such that the proposed Plan would impede sustainable management of groundwater basins or obstruct implementation of a sustainable groundwater management plan.

WS-3 Require or result in the relocation or construction of new or expanded water facilities, the construction or relocation of which could cause significant environmental effects.

4.18.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

WS-1 NOT HAVE SUFFICIENT WATER SUPPLIES AVAILABLE TO SERVE PROJECTED REGIONAL DEMAND DURING NORMAL, DRY, AND MULTIPLE DRY YEARS

ANALYSIS METHODOLOGY

To analyze 2025 and 2035 impacts of forecasted regional growth and land use change within the SDCWA service area, estimated water demand resulting from forecasted growth under the proposed Plan is compared to projected water demand and projected available supplies through 2035 as identified in the SDCWA 2013 Master Plan Update and 2020 UWMP. An assessment of water supply reliability is required by the UWMP Act. The assessment must compare projected water supply and demands over the ensuing 20 years. The SDCWA UWMP analysis covers the next 25 years, until the year 2045. The analysis must include projected water supply and demand in 5-year increments under normal, single dry water years, and multiple dry water years. Given these requirements, the UWMP is suitable for answering Impact WS-1. Material in this section is derived from the SDCWA UWMP unless otherwise indicated.

The analysis of regional water demands conducted is based on projections of both normal and dry-year annual demands from the 2020 UWMP. Normal, dry, and multiple dry-year annual demands were consistent with those in the 2020 UWMP for each member agency. Projected water supply for a normal water year is based on forecasts provided by the 2020 UWMP within SDCWA's service area in a normal water year and single dry water year through 2045.

For the 2050 analysis of regional growth and land use change, "projected per capita usage in gallons per day multiplied by forecasted future population" is used to project water demand. Most urban areas in the region depend upon a combination of surface water, recycled water, and water conservation to provide sufficient water supplies for their existing and planned residents and businesses. Table 4.18-11 shows the 2020 UWMP normal water year assessment, summarizing the total water demands within the SDCWA service area through the year 2045.

A 2050 population of 3,746,073 is forecast. Of this total, 101,317 people are projected to reside outside the SDCWA service area. Water demand in 2050 was estimated using the 2020 UWMP assumptions for population and water demand in 2045 for normal year conditions. These assumptions were used to develop per capita rates for each scenario (i.e., acre-feet per person during normal year, single dry year, multiple dry years). These per capita rates were then applied to forecasted 2050 population under the proposed Plan to calculate the following 2050 water demands under the proposed Plan. Water demand for 2050 was calculated at 646,920 acre-feet. The construction of new transportation network improvements, including roadways, bicycle and pedestrian facilities, and transit facilities, and operation and maintenance of new facilities could increase the demand for water for construction activities such as concrete mixing and dust control, and operational activities and services such as restrooms and drinking fountains. These water demands are evaluated

qualitatively to determine whether they could contribute to a situation where insufficient water supply to meet regional demands exists.

Table 4.18-11
2020 UWMP Normal Water Year Supply and Demand Assessment (acre-feet/year)

	2025	2030	2035	2040	2045
Water Authority Supplies					
Imperial Irrigation District Water Transfer	200,000	200,000	200,000	200,000	200,000
ACC and CC Lining Projects	78,700	78,700	78,700	78,700	78,700
Carlsbad Desalination Plant	50,000	50,000	50,000	50,000	50,000
Subtotal	*328,700*	*328,700*	*328,700*	*328,700*	*328,700*
Member Agency Supplies (Verifiable)					
Surface Water	43,957	43,957	44,659	44,659	44,659
Water Recycling	42,993	46,493	46,593	46,693	46,793
Seawater Desalination	6,000	6,000	6,000	6,000	6,000
Potable Reuse	33,042	53,202	112,562	112,562	112,562
Brackish Groundwater Recovery	8,400	8,400	8,400	8,400	8,400
Groundwater	21,900	23,100	23,100	19,600	19,600
San Luis Rey Water Transfers	15,800	15,800	15,800	15,800	15,800
Subtotal	*172,092*	*196,952*	*257,114*	*253,714*	*253,814*
Metropolitan Water District Supplies	54,966	52,592	12,660	31,821	48,257
Total Projected Supplies	**555,758**	**578,244**	**598,474**	**614,235**	**630,771**
Total Long-Range Demand[2] Forecast with Conservation	**555,758**	**578,244**	**598,474**	**614,235**	**630,771**

Source: San Diego County Water Authority 2021a.
[1] Normal water year demands based on 1960-2018 hydrology.
[2] Supply and Demand are identical because the residual shortfall after accounting for SDCWA and Member Agency supplies is offset by purchases from MWD.
ACC = All=American Canal; CC = Coachella Canal

A significant impact would occur if the projected available regional water supplies and water delivery infrastructure are not able to meet regional demand during normal, dry, and multiple dry-year scenarios. The analysis is done for 2025 and 2035. Insufficient data on water supplies exists for a complete 2050 analysis; therefore, due to uncertainty about 2050 water supplies., the 2050 impact is considered significant. For transportation network improvements a qualitative analysis is included for water required for the production of concrete and dust suppression as well as operational water demands (e.g., landscape irrigation) of transportation network improvements. A significant impact would occur if existing and future water supplies available within the San Diego region would not be sufficient to meet regional water demands associated with transportation network improvements.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Examination of Table 4.18-11 indicates that the SDCWA projects adequate water supply to meet the 2025 demand of regional growth and land use change. Total water demand for 2025 is projected at 555,758 acre-feet. Sources of water supply include SDCWA supplies, totaling 328,700 acre-feet, originating from the following:

- IID Water Transfer
- All-American Canal and Coachella Canal Lining Projects
- Carlsbad Desalination Plan

The water derived from the IID Water Transfer and the canal lining projects is stored by MWD in Lake Mead and becomes part of the MWD water supply. Under an agreement between MWD and SDCWA, MWD agrees to provide a like amount of water from its overall supply (MWD 2021a).

Member agency supplies contributing to the regional water supply from the following sources total 172,092 acre-feet:

- Surface Water
- Water Recycling
- Seawater Desalination
- Potable Reuse
- Brackish Groundwater Recovery
- San Luis Rey River Water Transfers

In addition to the above supplies, SDCWA would purchase 54,966 acre-feet from MWD. Consultation with MWD has confirmed that this amount is available and is included in the calculations utilized by MWD in preparing their own UWMP (MWD 2021a).

In the single dry-year assessment for 2025, SDCWA assumed the continuation of long-term water efficiencies, but conservatively did not include additional potential savings derived from extraordinary conservation occurring during droughts. The groundwater and surface water yields assumed in the 2025 dry-year scenario are based on the very low yields of 2015. Other SDCWA supplies and member agency supplies were considered drought resilient. Dry-year assessments in five-year increments are presented in Table 4.18-12.

Table 4.18-12
Single Dry-Year Supply and Demand Assessment in 5-Year Increments (acre-feet per year)

	2025	2030	2035	2040	2045
Water Supply					
Water Authority Supplies					
Imperial Irrigation District Water Transfer	200,000	200,000	200,000	200,000	200,000
ACC and CC Lining Projects	78,700	78,700	78,700	78,700	78,700

	2025	2030	2035	2040	2045
Regional Seawater Desalination	50,000	50,000	50,000	50,000	50,000
Subtotal	*328,700*	*328,700*	*328,700*	*328,700*	*328,700*
Member Agency Supplies[1]					
Surface Water	6,004	6,004	6,004	6,004	6,004
Water Recycling	42,993	46,493	46,593	46,693	46,793
Seawater Desalination	6,000	6,000	6,000	6,000	6,000
Potable Reuse	33,042	53,202	112,562	112,562	112,562
Brackish Groundwater Recovery	8,400	8,400	8,400	8,400	8,400
Groundwater	15,281	15,281	15,281	15,281	15,281
San Luis Rey Water Transfers	15,800	15,800	15,800	15,800	15,800
Subtotal	*127,520*	*151,180*	*210,640*	*210,740*	*210,840*
Other Supplies					
Metropolitan Water District Supplies	336,232	336,674	337,116	337,558	338,000
Potential Supply (Shortage) or Surplus	195,487	197,675	237,146	221,944	206,220
Subtotal	*127,520*	*151,180*	*210,640*	*210,740*	*210,840*
Total Projected Core Supplies with Use of Carryover Storage Supplies	**792,452**	**816,554**	**876,456**	**876,998**	**877,540**
Water Demand					
Total Single Dry-Year Demands with Conservation	792,452	816,554	876,456	876,998	877,540
Total Demands with Water Efficiency Savings	596,965	618,879	639,310	655,054	671,320
Remaining Potential Surplus Supply, or (Shortage) That Will Be Addressed Through Management Actions	**195,487**	**197,675**	**237,146**	**221,944**	**206,220**

Source: San Diego County Water Authority 2021a.
[1] Member agency local supplies include production from verifiable reliable sources, as well as dry-year totals for actual 2015 surface water and groundwater supplies.
ACC = All=American Canal; CC = Coachella Canal.

Importantly, the SDCWA 2025 dry-year assessment assumes a major increase in water purchases from MWD. Purchases from MWD would increase from 54,966 under the 2025 normal-year scenario to 336,232 under the 2025 dry-year scenario. The UWMP states:

> For this single dry-year assessment, it was assumed that Metropolitan supplies are limited to 1.3 million AF [acre-feet] due to dry conditions and additional reduction in Metropolitan's deliveries from State Water Project (i.e., no Delta improvements) and Colorado River, and that the Water Authority received its preferential right based on Metropolitan's current method of calculating such rights.

MWD member agencies' ability to exercise preferential water rights was confirmed in a lawsuit filed by the SDCWA in 2001. The court decision affirmed the preferential right of each member agency to MWD water. The calculation of each member agency's preferential rights was clarified in a 2010 lawsuit filed by the SDCWA regarding payments to transport its independent Colorado River supplies through the MWD conveyance system (SDCWA 2021a). As of June 30, 2020, the SDCWA has a preferential right to purchase 25.83 percent of Metropolitan's water. By comparison, the SDCWA purchased about 6 percent of the water Metropolitan sold in fiscal year 2020 (SDCWA 2021a). Review of the MWD UWMP (2021a) dry-year water supply projections suggests that MWD supplies available to member agencies would be adequate to meet SDCWA demand assuming exercise of preferential water rights.

In assessing a multiple dry-year scenario ending in 2025 the SDCWA reached a similar conclusion regarding sufficient water supplies (see Table 4.18-13). Member agency supplies were reduced reflecting the decline in surface water and groundwater availability. SDCWA supplies derived from water transfers would be maintained at a static level. The SDCWA would continue to exercise its preferential right to the MWD supply of water available for wholesale. Review of the MWD UWMP (2021a) confirms that, assuming access to 25.83 percent of MWD supplies amidst a 5-year period, SDCWA would have sufficient supplies to fulfill local demand and would be able to augment local water storage.

Table 4.18-13
2021–2025 Multiple Dry Water Year Supply and Demand Assessment (acre-feet per year)

	2021	2022	2023	2024	2025
Member Agency Supplies[1]	153,762	152,645	132,982	109,672	127,481
Water Authority Supplies	328,700	328,700	328,700	328,700	328,700
Metropolitan Allocation (Preferential Right)	335,878	310,123	310,205	310,286	310,368
Total Estimated Core Supplies without Storage Takes	**818,340**	**791,468**	**771,887**	**748,658**	**766,549**
Total Multiple Dry-Year Demands with Conservation Savings	580,626	586,432	592,296	598,219	604,201
Remaining Potential Surplus Supply, or (Shortage) to Be Addressed Through Management Actions	**237,714**	**205,036**	**179,591**	**150,439**	**162,348**

Source: San Diego County Water Authority 2021a.
[1] Member agency local supplies include verifiable recycling and brackish groundwater recovery, San Luis Rey water transfer, seawater desalination, as well as dry-year estimates for surface water and groundwater.

A review of SDCWA and MWD planning documents allows a conclusion that there would be sufficient water supplies to satisfy the requirements of regional growth and land development in 2025, including in the event of a single or multiple dry years. Therefore, impacts regarding the availability of an adequate water supply to serve regional growth and land use change in 2025 would be less than significant.

Transportation Network Improvements and Programs

The construction of new transportation network improvements, including roadways, bicycle and pedestrian facilities, and transit facilities, and operation and maintenance of new facilities could increase the demand for water for construction activities such as concrete mixing and dust control, and operational activities and services such as restrooms and drinking fountains. These increases in demand are anticipated to be small on a per project basis. Landscaping for new Caltrans improvements would be irrigated with recycled water. In addition, large-scale regional transportation improvements have been underway for more than 15 years since the passage of Proposition A and the institution of a half-cent sales tax. This increase in water demand has not been identified as a significant component of regional demand, and impacts are not considered significant.

The construction of new transportation facilities would also increase demand for water use to irrigate new landscaping installed along roadways. This demand is not seen to result in significant impacts, as reclaimed water, of which there is a regional surplus, is used for this purpose in most areas. Any landscaping installed in outlying areas would be composed of native species with minimal water requirements.

2025 Conclusion

Water supplies are seen as adequate to serve regional growth and land use change and transportation network improvements and programs up until the year 2025. The water supply is adequate to serve these needs even in the event of a dry year or multiple dry years. The impacts of regional growth and land use change and transportation network improvements and programs on water supplies between 2016 and 2025 are less than significant.

2035

Regional Growth and Land Use Change

As shown in Table 4.18-11 above, the SDCWA UWMP shows an adequate water supply of 598,474 acre-feet for the year 2035 assuming normal conditions. SDCWA supplies from water transfers remain constant as to the supplies of member agencies. One notable development is the increase in member agency supply. This supply increases potable reuse from 33,042 acre-feet per year in 2025 to 112,562 acre-feet per year in 2035 due to increased supplies from the City of San Diego's Pure Water Program.

The increase in SDCWA member agency supplies is also reflected in the 2035 single dry-year assessment, as shown in Table 4.18-12 above. Examination of the MWD UWMP (2021a) confirms that, assuming the SDCWA has the ability to purchase wholesale water at a level determined by preferential right, adequate water supplies are available.

Assessment of 5-year multiple dry water supplies and demands between 2026 and 2035, as shown in Tables 4.18-14 and 4.18-15, indicate adequate water supply throughout these multiple dry-year periods. SDCWA water supplies from water transfers are constant. Member agency supplies consistently decrease from year-to-year as available surface water and groundwater both decline due to succeeding dry years.

Table 4.18-14
2026–2030 Multiple Dry Water Year Supply and Demand Assessment (acre-feet per year)

	2026	2027	2028	2029	2030
Member Agency Supplies[1]	213,285	209,508	190,545	167,935	151,180
Water Authority Supplies	328,700	328,700	328,700	328,700	328,700
Metropolitan Allocation (Preferential Right)	336,320	310,531	310,613	310,694	310,776
Total Estimated Core Supplies without Storage Takes	**878,305**	**848,739**	**829,858**	**807,329**	**790,656**
Total Multiple Dry-Year Demands with Water Conservation Savings	602,935	608,964	615,054	621,204	627,416
Remaining Potential Surplus Supply, or (Shortage) to Be Addressed Through Management Actions	275,370	239,775	214,804	186,125	163,240

Source: San Diego County Water Authority 2021a.
[1] Member agency local supplies include verifiable recycling and brackish groundwater recovery, potable reuse, San Luis Rey water transfer, seawater desalination, as well as dry-year estimates for surface water and groundwater.

Table 4.18-15
2031–2035 Multiple Dry Water Year Supply and Demand Assessment (acre-feet per year)

	2031	2032	2033	2034	2035
Member Agency Supplies[1]	216,105	211,648	192,005	168,715	210,640
Water Authority Supplies	328,700	328,700	328,700	328,700	328,700
Metropolitan Allocation (Preferential Right)	336,762	310,939	311,021	311,102	311,184
Total Estimated Core Supplies without Storage Takes	**881,567**	**851,287**	**831,726**	**808,517**	**850,524**
Total Multiple Dry-Year Demands with Water Conservation Savings	625,067	631,318	637,631	644,008	650,448
Remaining Potential Surplus Supply, or (Shortage) to be addressed through Management Actions	256,500	219,969	194,095	164,509	200,076

Source: San Diego County Water Authority 2021a.
[1] Member agency local supplies include verifiable recycling and brackish groundwater recovery, potable reuse, San Luis Rey water transfer, seawater desalination, as well as dry-year estimates for surface water and groundwater.

The 2026–2030 Multiple Dry Water Year scenarios continue to assume purchase of between 310,613 and 336,762 acre-feet per year of water from MWD. This assumption is based on preferential right to, and purchase of, 25.83 percent of an MWD supply of 1.2 to 1.3 million acre-feet. The MWD UWMP (2021a) projects that this quantity of supply would be available.

A review of SDCWA and MWD planning documents allows a conclusion that there would be sufficient water supplies to satisfy the requirements of regional growth and land development between 2026 and 2035, including in the event of a single or multiple dry years. Therefore, impacts related to the availability of an adequate water supply to serve regional growth and land use change between 2026 and 2035 would be less than significant.

Transportation Network Improvements and Programs

The construction of new transportation network improvements, including roadways, bicycle and pedestrian facilities, and transit facilities, and operation and maintenance of new facilities could increase the demand for water for construction activities such as concrete mixing and dust control, and operational activities and services such as restrooms and drinking fountains. These increases in demand are anticipated to be small on a per project basis. In addition, large-scale regional transportation improvements have been underway for more than 15 years since the passage of Proposition A and the institution of a half-cent sales tax. This increase in water demand has not been identified as a significant component of regional demand, and impacts are not considered significant.

The construction of new transportation facilities would also increase demand for water use to irrigate new landscaping installed along roadways. This demand is not seen to result in significant impacts, as reclaimed water, of which there is a regional surplus, is typically available for this purpose in most areas. Any landscaping installed in outlying areas would be composed of native species with minimal water requirements.

2035 Conclusion

Water supplies are seen as adequate to serve regional growth and land use change and transportation network improvements and programs between 2026 and 2035. The water supply is adequate to serve these needs even in the event of a dry year or multiple dry years. This impact would, therefore, be less than significant.

2050

Water demand in 2050 was estimated using the 2020 UWMP assumptions for population and water demand in 2045 for normal year conditions. These per capita rates were then applied to forecasted 2050 population under the proposed Plan to calculate the 2050 water demands under the proposed Plan. Water demand for 2050 was calculated at 646,920 acre-feet.

Regional Growth and Land Use Change

SDCWA and member agency normal-year supplies are constant for the 2035–2045 period. Using these same factors in 2050 would result in a total local water supply of 582,514 acre-feet. This shortfall of 64,406 acre-feet from the calculated regional demand of 646,920 acre-feet could only be obtained from MWD. This amount would be well within an amount eligible for purchase based on SDCWA preferential rights. However, MWD wholesale supplies cannot be confirmed in 2050 as MWD planning documents do not extend beyond a horizon of 2045. The inability to confirm the availability of MWD wholesale supplies for the year 2050 makes it difficult to determine that adequate water supplies are available to support regional growth and land use change. This uncertainty means that there may be insufficient regional water supplies to meet regional water demand in 2050, a significant impact.

As shown above in Table 4.18-12, single dry-year assessments prepared for the SDCWA UWMP do not extend beyond 2045. Using the same methodology employed to estimate 2050 normal year water demand, the single dry-year demand for the SDCWA service area is estimated at 878,082 acre-feet. SDCWA and member agency supplies are uniform across both the 2040 and 2045 dry-year estimates at 539,540 acre-feet. Use of these water supply calculations in a 2050 dry-year scenario would result in a shortfall of 338,542 acre-feet. This quantity is of a magnitude that it would only be available with the exercising of SDCWA's preferential rights to MWD supplies. As there are no projections of MWD supplies available for wholesale in 2050, however, the availability of this supply cannot be confirmed.

Multiple dry-year assessments for the years 2036–2040 and 2041–2045 are presented below. In both scenarios, SDCWA member agency supplies, consisting of groundwater and surface water, decline over time. SDCWA supplies derived from water transfers are constant. In all instances the shortfall between supply and overall demand would be bridged via the SDCWA exercising its preferential right and acquiring additional wholesale supplies from MWD.

Table 4.18-16
2036–2040 Multiple Dry Water Year Supply and Demand Assessment (acre-feet per year)

	2036	2037	2038	2039	2040
Member Agency Supplies[1]	275,565	271,108	251,465	228,175	210,740
Water Authority Supplies	328,700	328,700	328,700	328,700	328,700
Metropolitan Allocation (Preferential Right)	337,204	311,347	311,429	311,510	311,592
Total Estimated Core Supplies without Storage Takes	**941,469**	**911,155**	**891,594**	**868,385**	**851,032**
Total Multiple Dry-Year Demands with Water Conservation Savings	645,703	652,160	658,681	665,268	671,921
Remaining Potential Surplus Supply, or (Shortage) to Be Addressed Through Management Actions	295,766	258,995	232,913	203,117	179,111

Source: San Diego County Water Authority 2021a.
[1] Member agency local supplies include verifiable recycling and brackish groundwater recovery, potable reuse, San Luis Rey water transfer, seawater desalination, as well as dry-year estimates for surface water and groundwater.

Table 4.18-17
2041–2045 Multiple Dry Water Year Supply and Demand Assessment (acre-feet per year)

	2041	2042	2043	2044	2045
Member Agency Supplies[1]	275,665	271,208	251,565	228,275	210,840
Water Authority Supplies	328,700	328,700	328,700	328,700	328,700
Metropolitan Allocation (Preferential Right)	337,646	311,755	311,837	311,918	312,000
Total Estimated Core Supplies without Storage Takes	**942,011**	**911,663**	**892,102**	**868,893**	**851,540**
Total Multiple Dry-Year Demands with Water Conservation Savings	661,605	668,221	674,903	681,652	688,469
Remaining Potential Surplus Supply, or (Shortage) to Be Addressed Through Management Actions	280,406	243,442	217,199	187,241	163,071

Source: San Diego County Water Authority 2021a.
[1] Member agency local supplies include verifiable recycling and brackish groundwater recovery, potable reuse, San Luis Rey water transfer, seawater desalination, as well as dry-year estimates for surface water and groundwater.

There are no SDCWA dry-year water demand projections after 2045. There are year-to-year variations in various supply and demand factors in the 2036–2040 and 2041–2045 assessments that make an estimate for 2046–2050 impossible without more detailed input from the water agencies. It is certain, however, that satisfying regional water demand in multiple dry years from 2046–2050 would require that the SDCWA exercise its preferential rights and acquire well in excess of 300,00 acre-feet per year. The availability of this water supply cannot be confirmed.

Transportation Network Improvements and Programs

The construction of new transportation network improvements, including roadways, bicycle and pedestrian facilities, and transit facilities, and operation and maintenance of new facilities could increase the demand for water for construction activities such as concrete mixing and dust control, and operational activities and

services such as restrooms and drinking fountains. These increases in demand are anticipated to be small on a per project basis. In addition, large-scale regional transportation improvements have been underway for more than 15 years since the passage of Proposition A and the institution of a half-cent sales tax. This increase in demand has not been identified as a significant component of regional water demand and impacts are not considered significant.

The construction of new transportation facilities would also increase demand for water use to irrigate new landscaping installed along roadways. This demand is not seen to result in significant impacts, as reclaimed water, of which there is a regional surplus, is typically available for this purpose in most areas. Any landscaping installed in outlying areas would be composed of native species with minimal water requirements.

2050 Conclusion

The impacts of regional growth and land use change in 2050 would be significant; the impacts of transportation network improvements would be less than significant. The UWMPs prepared by SDCWA and MWD indicate that there would be sufficient water supplies to provide for regional growth and land development through the year 2045. Subsequent to this time, however, documentation regarding sufficient supplies is unavailable, creating uncertainty about regional water supplies in 2050. This uncertainty means that there may be insufficient regional water supplies to meet regional water demand in 2050, a significant impact (WS-1).

Exacerbation of Climate Change Effects

The proposed Plan could exacerbate climate change effects on the ability to have sufficient water supplies available to serve projected regional demand beyond the year 2045. Climate change would impact multiple sources of water. Reduced precipitation and changes in timing of snowpack melt are likely to decrease the region's imported water supply (Xiao et al. 2018, CEP and SDF 2015), which comes from mountain ranges, such as the Sierra Nevada and the mountains that supply the Colorado River (SDCWA 2016). Increased evaporation and drought may also decrease surface water supplies and result in depletions of groundwater supply (CEP and SDF 2015, SDF 2008). Furthermore, sea-level rise could result in saltwater intrusion of coastal groundwater supplies, decreasing available drinking water (USGS n.d.).

Climate change may also increase water demand. Increased drought and evapotranspiration may increase water demand for agriculture and landscaping irrigation due to lack of rainfall and higher temperatures (Christian-Smith et al. 2012). This can further strain water resources feeding the San Diego region. The proposed Plan's projected population growth would increase water demand even more and thus adds to the uncertainty surrounding whether the San Diego region will have sufficient water supplies in 2050 for projected demand during normal dry and multiple dry years.

MITIGATION MEASURES

WS-1 NOT HAVE SUFFICIENT WATER SUPPLIES AVAILABLE TO SERVE THE PROJECTED REGIONAL DEMAND DURING NORMAL DRY AND MULTIPLE DRY YEARS

2050

WS-1a Implement Water Conservation Measures for Transportation Network Improvements. SANDAG shall, and other transportation project sponsors can and should, implement feasible water conservation

measures during planning, design, project-level CEQA review, construction, operations, and maintenance of transportation network improvements, including, but not limited to, the following:

- Comply with all prevailing State, regional, and local government plans, laws, and policies regarding water conservation and efficiency.
- Install drip or other water-conserving or weather-based irrigation systems for landscaping.
- Install native plant species and noninvasive drought-tolerant/low-water-use plants in landscaping, consistent with the most recent State, regional, and local government plans, laws, and policies.
- Incorporate the use of reclaimed water (also known as recycled water) during planning, design, project-level CEQA review, construction, operations, and maintenance of transportation network improvements to reduce the use of potable water.

WS-1b Implement Water Conservation Measures for Development Projects. The County of San Diego, cities, and other local jurisdictions can and should implement feasible water conservation measures during planning, design, and project-level CEQA review of development projects, including, but not limited to, the following:

- Install drip or other water-conserving or weather-based irrigation systems for landscaping.
- Install native plant species and noninvasive drought-tolerant/low-water-use plants in landscaping, consistent with the most recent State, regional, and local government plans, laws, and policies.
- Install low-flow plumbing fixtures.
- Install water-efficient appliances.
- Incorporate the use of reclaimed water. Measures to incorporate reclaimed water may include, but are not limited to, onsite water recycling; the use of recycled water to fill lakes, ponds, and ornamental fountains; the use of recycled water for irrigation, to mix concrete, and to control dust at construction sites; the use of recycled water for certain industrial processes and for flushing toilets and urinals in nonresidential buildings; and the use of recycled water for street sweeping purposes.

WS-1c Ensure Adequate Water Supply for Development Projects. During planning, design, and project-level CEQA review for development projects, the County of San Diego, cities, and other local jurisdictions can and should ensure that adequate water supply will be available to meet or satisfy projected water demands, consistent with applicable UWMPs, Master Plans, and General Plan projections of water supply and demand. This can and should be documented in the form of an SB 610 Water Supply Assessment, an SB 221 Water Supply Verification, or other water supply analysis.

SIGNIFICANCE AFTER MITIGATION

2050

Between 2036 and 2050, adequate water supplies have not been identified. This uncertainty means that there may be insufficient regional water supplies to meet regional water demand, notwithstanding implementation of the above mitigation measures, creating a significant unavoidable impact in 2050.

WS-2 SUBSTANTIALLY DECREASE GROUNDWATER SUPPLIES, OR INTERFERE SUBSTANTIALLY WITH GROUNDWATER RECHARGE SUCH THAT THE PROPOSED PLAN WOULD IMPEDE SUSTAINABLE MANAGEMENT OF GROUNDWATER BASINS OR OBSTRUCT IMPLEMENTATION OF A SUSTAINABLE GROUNDWATER MANAGEMENT PLAN.

ANALYSIS METHODOLOGY

The analysis addresses the impacts of forecasted regional growth and land use change and transportation network improvements on groundwater supplies both within and outside of the SDCWA service area, and determines whether the proposed Plan would impede sustainable management of a groundwater basin or obstruct implementation of a GSP. As stated above, various public agencies are currently preparing sustainable GSPs for the San Diego River Valley, San Luis Rey Valley, and San Pasqual Valley basins that must be completed by January 2022. For sustainable groundwater management plans that are not yet adopted, the analysis focuses on whether the proposed Plan would impede sustainable management of a groundwater basin or impede or obstruct implementation of the San Diego County Groundwater Study. For the Borrego Springs Subbasin GSP and adjudication, the analysis focuses on whether the proposed Plan would conflict with the project and management actions identified in the GSP to achieve the GSP's sustainability goal with plan implementation.

In addition, the analysis addresses increased use of groundwater and changes to groundwater recharge under the proposed Plan relative to the existing conditions, as described in the GSP. Groundwater use typically increases during dry years and decreases in wet years when surface water supplies are more available. Projected groundwater supply yield identified in the SDCWA 2020 UWMP ranges from a low of 25,950 acre-feet in 2020 to a high of 31,500 acre-feet in 2035. No groundwater availability projections are available for 2050. The analysis provides a qualitative discussion on how forecasted regional growth and land use change could interfere with groundwater recharge by creating additional impervious surfaces. Forecasted regional growth and land use change would also create additional demands for water supplies from local water supply agencies, a portion of which may be provided by groundwater; the analysis addresses these impacts as well.

A general discussion is provided to describe the proximity of planned transportation network improvements to documented groundwater resources and to determine whether they would impede sustainable groundwater management or conflict with or obstruct implementation of the existing County Groundwater Study and the Borrego Valley GSP. Transportation projects may increase impervious surfaces, but would have very limited demands for water supplies; therefore, they would not substantially affect groundwater resources such that they would result in land subsidence or create groundwater overdraft conditions. With regard to groundwater recharge, many of the proposed transportation facilities are on or adjacent to existing highways, streets, and roads in which most of the surfaces are already paved or impervious. The analysis will evaluate how the proposed Plan could result in the implementation of new roadways dispersed throughout the Plan Area. These new impervious surfaces, while planned for by local implementing agencies, could contribute to limiting regional groundwater recharge if they would substantially decrease groundwater supplies or substantially limit recharge in the areas of new impervious surfaces. If either of these scenarios occurs, it would be considered an impediment to sustainable management of a groundwater basin, and would be a significant impact.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Groundwater basins in San Diego County occur both within the service area of the SDCWA and in the eastern two-thirds of the County that is entirely dependent on groundwater for all water uses. The population of the portion of the County outside of the SDCWA service area was 95,171 in 2016. This population is forecasted to increase to 95,952 in 2025, 98,754 in 2035, and 101,317 in 2050. The County of San Diego General Plan Update EIR, Appendix D (County of San Diego 2010a) evaluated the groundwater impacts of forecasted growth and land use change within groundwater-dependent areas overlying fractured-rock aquifers in the unincorporated county. All fractured-rock aquifers and groundwater basins outside of the SDCWA service area were evaluated. Groundwater level data from a preceding 34-year period was analyzed. Using County of San Diego significance criteria, it was determined that a significant impact existed if, for at least 1 month during the period of analysis, the groundwater levels in the aquifers were reduced to or below 50 percent of the overall storage capacity of the groundwater basin or aquifer. It was found that 10 groundwater basins or aquifers had minimum storage levels below 50 percent under preexisting or existing conditions. These groundwater basins or aquifers were also below the 50 percent storage threshold under General Plan buildout conditions. When General Plan land use buildout conditions were modelled across the eastern two-thirds of the county, an additional 13 groundwater basins or aquifers were found to fall below the 50 percent storage threshold. The County groundwater study also concluded that in several areas under both existing and future conditions there were groundwater supply issues caused by a concentration of wells in a limited area. Any regional growth occurring between 2016 and 2025 in the 10 identified groundwater basins or aquifers with existing insufficient groundwater storage, or in the additional 13 groundwater basins or aquifers identified as having insufficient storage under General Plan buildout conditions would be a significant impact.

After the passage of the SGMA, groundwater basins were assessed across the state by the DWR. The groundwater basins were classified as high-, medium-, or low-priority based on groundwater storage and overdraft conditions. The SGMA requires medium- and high-priority basins to develop GSAs, develop GSPs, and manage groundwater for long-term sustainability. Three basins in San Diego County were identified as medium priority. An additional groundwater subbasin, the Borrego Valley Subbasin (discussed below), was determined to be a high priority due to "critical overdraft" conditions. The medium-priority basins in San Diego County are the San Luis Rey River Valley Groundwater Basin, the San Pasqual Valley Groundwater Basin, and the San Diego River Groundwater Basin. The GSAs for these three basins are mandated to finalize a GSP for approval by DWR by January 31, 2022. It should be noted that a large majority of the land overlying these three medium-priority groundwater basins is within the SDCWA service area. Although water is available from the SDCWA distribution system, groundwater in these basins provides a supplemental source of water for agricultural, domestic, and industrial uses. While monitoring wells track groundwater levels in these groundwater basins, there is currently no comprehensive information regarding the quantity of groundwater pumped from these basins.

Population increases are forecasted in the area overlying only one of these groundwater basins. Population in the San Diego River Valley Basin area is forecasted to increase from 49,479 in 2016 to 50,547 in 2025. Population in the San Luis Rey River Valley and the San Pasqual Valley Basins areas is forecasted to decrease. While it can be assumed that residential water use would decrease because of this population decline, this does not preclude an increased demand on groundwater supplies from agricultural or other users. Upon completion of a GSP, a mechanism will be in place to ensure that a new permitted use of groundwater within these basins

is consistent with the sustainable management of groundwater levels in these basins over time. Until such time as an approved GSP is in place, regional growth and land use changes resulting in an increase in groundwater use within the San Diego River Valley Basin area would cause a significant groundwater impact.

Under the terms of the Settlement Agreement, all parcels within the Borrego Water District will henceforth be metered by BWD to measure water use. All users will be required to reduce groundwater withdrawals by 5 percent each year. By 2030, all will have halved their baseline amounts, and by 2040 groundwater and thereafter withdrawal will be reduced by 75 percent. From that time forward groundwater withdrawal will match basin recharge (see *Borrego Water District v. All Persons who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin No. 7.024-01 Whether Based on Appropriation, Overlying Right, or Other Basis Of Right, and/or Who Claim a Right to Use of Storage Space in the Subbasin*).

A modest increase in population within the boundaries of the Borrego Valley Subbasin is forecast: from 4,721 in 2016 to 4,825 in 2025. As this population increase would be accompanied by at least some new development, BWD was contacted regarding the procedure for allowing new connections to their distribution system, or for allowing new metered wells. After the adjudication, new connections or wells will only be permitted by BWD in instances where the applicant has previously obtained sufficient water rights from preexisting water users. In addition, the applicant would be required to obtain sufficient preexisting water rights to allow for a sufficient level of water use *after* the reductions required by 2040. Regional water planning is based on a requirement of 0.5 acre-foot by a single-family dwelling unit. BWD will require that an applicant for a new residential connection purchase 2.42 acre-feet of water rights from existing users. This multiplier accounts for a 75 percent reduction from current water use plus an additional allowance for distribution system loss. This will allow the needed reductions over time to meet the sustainable aquifer withdrawal level by 2040 (Poole pers. comm.). As such, this population increase would not worsen the "Critical Overdraft" condition currently affecting this aquifer, as any new connection will only occur after the acquisition of preexisting water rights sufficient to allow for future incremental reductions in groundwater withdrawals required by the adjudication and thereby achieve aquifer sustainability.

The adjudication of the Borrego Valley Subbasin provides a regulatory framework for allowing some new development within the BWD service area. New development, and the Borrego Valley Subbasin's portion of forecasted regional growth, would only occur after the proposed new development has purchased preexisting water rights. These purchased preexisting rights would be in sufficient quantity to provide for the required future reductions in allowed groundwater withdrawal. Any forecasted regional growth that occurs within the boundaries of the Borrego Valley Subbasin would not substantially decrease groundwater supplies as it would be a portion of a groundwater budget set by, and incrementally reduced by, the terms of the adjudication. The water used by this future growth would be consistent with the terms of the adjudication and would therefore not interfere with the sustainable management of the Borrego Valley Subbasin aquifer, or the implementation of the Borrego Valley GSP, the terms of which were implemented via the adjudication.

Regional growth and land development would occur on land overlying groundwater basins and rural aquifers outside of the SDCWA service area that were identified by the County of San Diego (2010b) as currently having an insufficient level of aquifer storage to ensure sustainability or were projected to have unsustainable storage levels with General Plan buildout. Among these identified groundwater basins or aquifers, it is forecasted that between 2016 and 2025 there would be substantial population increases in areas relying on the Escondido Creek and Poway Valley groundwater basins. The population of the area overlying the Escondido Creek groundwater basin is projected to increase by 1,068. The population of the area overlying the Poway Valley groundwater basin is projected to increase by 1,008. While both basins are within the SDCWA service area, the

underlying aquifer is being utilized at an unsustainable level. Growth would exacerbate current unsustainable condition characterizing these aquifers and would cause a significant groundwater impact.

Transportation Network Improvements and Programs

Transportation network improvements have the potential to affect groundwater supplies through stormwater runoff. Stormwater is defined by the EPA as the runoff generated when precipitation from rain and snowmelt events flows over land or impervious surfaces without percolating into the ground (SWRCB 2020). Stormwater is often considered a nuisance because it mobilizes pollutants such as motor oil and trash. Stormwater discharges in California are regulated through National Pollutant Discharge Elimination System (NPDES) permits. Transportation network improvements made within already urbanized areas, such as the Central and San Ysidro Mobility Hubs, create lass impact as they do not represent a net increase in impervious surfaces. Water quality aspects of stormwater originating from transportation network improvements are analyzed in Section 4.10. At issue is the effects of stormwater originating from network transportation improvements on the water supplies of underlying aquifers. As is noted by the SWRCB, stormwater may act as a resource and recharge to groundwater when properly managed.

Within the State of California, methods of accommodating stormwater in new transportation improvements financed all or in part with State or federal funds are governed by Caltrans design standards. Caltrans standards also typically serve as the basis for municipal designs, as the municipalities operate under similar NPDES permit requirements. The principles of Caltrans transportation improvement design related to stormwater management include the following (Caltrans 2016b):

- Conserve natural areas to the extent feasible, including existing trees, stream buffer areas, vegetation, and soils.
- Minimize the impervious footprint of the project.
- Minimize disturbances to natural drainages.
- Design pervious areas to effectively receive runoff from impervious areas, taking into consideration the pervious area's soil conditions, slope, and other pertinent factors.
- Incorporate landscape and soil-based best management practices (BMPs).
- Use climate appropriate landscaping, that minimizes irrigation and runoff, promotes surface infiltration and minimizes the use of pesticides and fertilizers.

Temporary BMPs are deployed to retain stormwater during project construction. Permanent BMPs encompassing the above design principles are incorporated into the permanent design of new transportation improvements. Permanent stormwater detention and treatment facilities are sized to accommodate 85 percent of the runoff from a typical 24-hour storm event, which is referred to as a "design event." In the San Diego region, the design event is determined based on subregional rainfall contour mapping (County of San Diego 2020). Permanent BMPs are typically earthen basins or swales that allow detained runoff to infiltrate into the soil and ultimately the underlying groundwater basin.

When new transportation improvements are constructed, the 85 percent detention requirement is applicable to the entire facility. When the transportation improvement is a redevelopment or an expansion of an existing facility, the impervious area detention requirements vary dependent upon the area of the new improvement. For highway projects of less than 1 acre or non-highway transportation projects of less than 5,000 square feet, only the redeveloped area and the hydraulically inseparable flow must be detained. For projects larger than these thresholds, the entire impervious surface within the project limits must be detained and treated (Caltrans

2016b). Because of these requirements, there would be no net increase in stormwater runoff because of transportation network improvements.

Between 2016 and 2025, several network improvements would be constructed on land overlying groundwater basins. Rail and arterial roadways would be constructed on land overlying the San Marcos Area Groundwater Basin. Rail improvements would be built on land overlying the Escondido Creek Groundwater Basin. This basin was not identified as requiring a GSP by DWR. Arterial roadway improvements would be constructed on land overlying the Santa Maria Groundwater Basin. This basin was identified as having insufficient storage in the County Groundwater Study. I-5 Complete Corridor improvements would be constructed on land overlying the Sweetwater Valley and Otay Valley Groundwater Basins. These basins were not identified as requiring a GSP by DWR.

In determining the potential impact of transportation network improvements upon land overlying groundwater basins several factors should be considered. First, the total amount of new impervious surfaces resulting from transportation network improvements is extremely small in comparison to the size of the groundwater basins. Secondly, design storm detention requirements result in a groundwater replenishment scenario that is not dissimilar to natural conditions. The bulk of stormwater draining from new transportation facilities would be detained and allowed to infiltrate into the underlying soil. The residual amount would drain into storm sewers and ultimately watercourses. This is similar to natural conditions under which, after soil is fully saturated by infiltration of precipitation, runoff would travel as surface flow to watercourses. Finally, the detention requirements applied to new or expanded transportation improvements result in very little, if any, additional stormwater compared to existing conditions. Taking these factors into account allows a conclusion that transportation network improvements implemented between 2016 and 2025 would have less-than-significant impacts on groundwater supplies, groundwater recharge, or the sustainable management of groundwater basins.

2025 Conclusion

Regional growth and land development would result in population increases on land overlying one of the three groundwater basins requiring preparation of a GSP because of being identified as medium priority by DWR, the San Diego River Valley Basin. Regional growth and land development would also occur on land overlying the Escondido Creek and Poway Valley groundwater basins, which were identified by the County as having insufficient storage. This growth would exacerbate the existing overdraft or insufficient storage in these basins. Regional growth on land overlying medium-priority groundwater basins would also contribute to an existing aquifer overdraft. Groundwater impacts of regional growth and land use change would therefore be significant in the Year 2025 (WS-2). Transportation network improvements implemented between 2016 and 2025 would not substantially reduce groundwater supplies, groundwater recharge, or the sustainable management of groundwater basins due to the relatively small area of additional impervious surfaces and stormwater detention requirements.

2035

Regional Growth and Land Use Change

Regional growth and land use change between 2026 and 2035 would continue to occur on land overlying groundwater basins. Outside of the SDCWA service area growth would occur on land overlying groundwater basins and rural aquifers identified by the County (2010a) as currently having an insufficient level of aquifer storage to ensure sustainability, or were projected to have unsustainable storage levels with General Plan

buildout. Among these identified groundwater basins, it is forecasted that between 2026 and 2035 there would be substantial population increases in the areas overlying Escondido Creek and Poway Valley aquifers. The population of the area overlying the Escondido Creek aquifer is projected to increase by 1,068. The population of the area overlying the Poway Valley aquifer is projected to increase by 1,008. While both basins are within the SDCWA service area, the underlying aquifers are being utilized at an unsustainable level. Growth would exacerbate current unsustainable condition characterizing these aquifers and would cause a significant groundwater impact.

A decrease in population between 2026 and 2035 in the areas overlying all three of the groundwater basins designated as medium priority by DWR is forecasted. The population on land overlying the San Diego River Valley groundwater basin is forecasted to decrease from 50,547 to 50,023. The population of the land overlying the San Luis Rey River Valley groundwater basin is forecasted to decrease from 62,655 to 59,935. The population of the land overlying the San Pasqual Valley groundwater basin is forecasted to decrease from 1,097 to 1,083. Forecasted regional growth would therefore not impact the groundwater supply or groundwater sustainability within these aquifers.

While the population of the land overlying the Borrego Valley Subbasin is forecasted to increase slightly between 2026 and 2035, from 4,825 to 4,880, this increase would not contribute to a significant impact. Groundwater use associated with any new service connection to the BWD distribution system would be offset by purchases of existing groundwater rights sufficient to allow continued reductions in overall groundwater use in accordance with the adjudication and to achieve a sustainable level of groundwater withdrawal by 2040.

Transportation Network Improvements and Programs

Transportation network improvements constructed on land overlying groundwater basins between 2026 and 2035 would consist primarily of highway improvements. Complete corridor improvements along I-5, I-8, I-15, and SR 163 would cross land overlying the Mission Valley Groundwater Basin. I-8 Complete Corridor improvements would also cross land overlying the El Cajon Valley Groundwater Basin. SR 78 Complete Corridor Improvements would cross land overlying the San Marcos Area Groundwater Basin and the Escondido Creek Groundwater Basin. None of these were determined to be of medium or high priority by DWR due to overdraft conditions. The Escondido Creek Groundwater Basin was determined to have inadequate storage capacity under General Plan buildout conditions.

All new or expanded transportation network improvements developed between 2026 and 2035 would be required to detain stormwater runoff from newly created impervious services. Stormwater runoff equivalent to 85 percent of that generated by a design storm event would be detained in earthen basins or swales and allowed to infiltrate into the subsoil. This stormwater detention and infiltration would be sufficient to prevent any significant impacts on underlying groundwater basins or on groundwater sustainability.

2035 Conclusion

Regional growth and land use change between 2026 and 2035 outside of the SDCWA service area would occur on land overlying the Poway Valley and the Escondido Creek groundwater basins, both of which were identified by the County (2010a) as currently having an insufficient level of aquifer storage to ensure sustainability or were projected to have unsustainable storage levels with General Plan buildout. Regional growth and land use change would therefore, result in significant impacts on the groundwater supplies in basins and on groundwater basin sustainability in the Year 2035 (WS-2). Transportation network improvements would have

sufficient stormwater detention facilities to prevent significant impacts on groundwater supplies or groundwater basin sustainability.

2050

Regional Growth and Land Use Change

Regional growth and land use change between 2036 and 2050 would continue to occur on land overlying groundwater basins. Outside of the SDCWA service area growth would occur on land overlying rural groundwater aquifers identified by the County (2010a) as currently having an insufficient level of aquifer storage to ensure sustainability, or were projected to have unsustainable storage levels with General Plan buildout. Among these identified groundwater basins, it is forecasted that between 2036 and 2050 there would be population increases in the Escondido Creek and Poway Valley Groundwater Basins. Populations are projected to increase by 594 on land overlying the Escondido Creek Groundwater Basin and by 48 on land overlying the Poway Valley Groundwater Basin. While both basins are within the SDCWA service area, the underlying aquifers are being utilized at an unsustainable level. Growth would exacerbate current unsustainable condition characterizing these aquifers and would cause a significant groundwater impact.

An increase in population is forecasted between 2036 and 2050 in two of the three groundwater basins designated as medium priority by DWR. Forecasted regional growth would increase the population of land overlying the San Diego River Valley and San Pasqual Valley Groundwater Basins by 403 and 62, respectively. These potential contributions to an existing aquifer overdraft would cause a significant groundwater impact. The population in the Borrego Valley Subbasin area is forecasted to increase slightly to 5,091 between 2036 and 2050; however, this increase would not contribute to a significant impact. Groundwater use associated with any new service connection to the BWD distribution system would be offset by purchases of existing groundwater rights sufficient to allow continued reductions in overall groundwater use in accordance with the adjudication and to achieve a sustainable level of groundwater withdrawal by 2040.

Transportation Network Improvements and Programs

Transportation network improvements constructed on land overlying groundwater basins between 2036 and 2050 would consist primarily of highway and rail improvements. Complete corridor improvements along the I-5 would cross the land overlying the San Dieguito Creek and San Luis River Groundwater Basins. SR 125 Complete Corridor improvements would cross the land overlying the San Diego River Groundwater Basin. Rail improvements would cross the land overlying the Otay Valley, Sweetwater Valley, and Escondido Creek Groundwater Basins. The San Diego River Valley and the San Luis Rey River Groundwater Basins were determined to be of medium or high priority by DWR due to overdraft conditions. The Escondido Creek Groundwater Basin was determined to have inadequate storage capacity under General Plan buildout conditions.

All new or expanded transportation network improvements developed between 2036 and 2050 would be required to detain stormwater runoff from newly created impervious services. Stormwater runoff equivalent to 85 percent of that generated by a design storm event would be detained in earthen basins or swales and allowed to infiltrate into the subsoil. This stormwater detention and infiltration would be sufficient to prevent any significant impacts on underlying groundwater basins or on groundwater sustainability.

2050 Conclusion

Between 2036 and 2050 regional growth and land use change would continue to occur, with a forecasted increase in population, on land overlying the Escondido Creek and Poway Valley aquifers, both of which have been identified by the County as having inadequate storage. Regional growth and land use change would also result in population increases on land overlying the San Pasqual and San Diego River groundwater basins, which have been designated as medium priority by DWR. Additional demand upon these groundwater basins would be unsustainable. Regional growth and land use change would therefore result in significant impacts on the groundwater supplies in basins and on groundwater basin sustainability in the Year 2050 (WS-2). Transportation network improvements would have sufficient stormwater detention facilities to prevent significant impacts on groundwater supplies or groundwater basin sustainability.

Exacerbation of Climate Change Effects

The proposed Plan could exacerbate climate change effects on decreasing groundwater supplies or interfering with groundwater recharge in a way that impedes sustainable groundwater management. Climate change could directly affect groundwater supplies, such as through saltwater intrusion, which contaminates potable groundwater along the coast (USGS n.d.). Climate change effects on other water supplies—such as decreases in imported water and surface water—also affect groundwater, as decreases in other supplies result more groundwater withdrawals (CEP and SDF 2015).

The proposed Plan would increase population in the San Diego region, further increasing demand for groundwater. Furthermore, development for the proposed Plan would increase the number of impervious surfaces, which could impede groundwater recharge (Bedsworth et al. 2018), decreasing the potential for more groundwater supplies in the future. Thus, the proposed Plan could exacerbate sustainable groundwater management that is already expected to be strained in the future under climate change.

MITIGATION MEASURES

WS-2 SUBSTANTIALLY DECREASE GROUNDWATER SUPPLIES OR INTERFERE SUBSTANTIALLY WITH GROUNDWATER RECHARGE SUCH THAT THE PROPOSED PLAN WOULD IMPEDE SUSTAINABLE MANAGEMENT OF GROUNDWATER BASINS OR OBSTRUCT IMPLEMENTATION OF A SUSTAINABLE GROUNDWATER MANAGEMENT PLAN

2025, 2035, and 2050

Implement mitigation measures **WS-1a** and **WS-1b**, as described above.

WS-2 Implement Groundwater Measures to Ensure Sustainable Yield For Development Projects. The County of San Diego, cities, and other local jurisdictions can and should ensure sustainable yield of groundwater basins during planning, design, and project-level CEQA review of development projects, by taking measures including, but not limited to, the following:

- Participate in a groundwater trading program to enable permanent transfer and potentially long-term and short-term lease of baseline pumping allocations to allow groundwater users or new development to purchase needed groundwater allocation from others.

- Use drought-resistant landscaping options and provide information on where these can be purchased. Use of reclaimed water especially in median landscaping and hillside landscaping can and should be implemented where feasible.
- Ensure that projects requiring continual dewatering facilities implement monitoring systems and long-term administrative procedures to ensure proper water management that prevents degrading of surface water and minimizes, to the greatest extent possible, adverse impacts on groundwater for the life of the project. Comply with appropriate building codes and standard practices including the Uniform Building Code.
- Maximize, where practical and feasible, permeable surface area in existing urbanized areas to protect water quality, reduce flooding, allow for groundwater recharge, and preserve wildlife habitat. Minimize new impervious surfaces to the greatest extent possible, including the use of in-lieu fees and offsite mitigation.
- Avoid designs that require continual dewatering where feasible. Where feasible, do not site transportation facilities in groundwater recharge areas, to prevent conversion of those areas to impervious surface.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Forecasted regional growth and land development between 2016 and 2050 would result in additional population in land overlying rural groundwater basins that have or are anticipated to have insufficient storage based on existing and projected groundwater withdrawals. This population increase would impede groundwater basin sustainability. Forecasted growth and land use change would result in population increases in areas overlying groundwater basins designated as medium priority by DWR due to overdraft conditions. This population increase would impede groundwater basin sustainability and would obstruct implementation of the required GMPs. Because it cannot be guaranteed that all future project-level groundwater impacts can be mitigated to a less-than-significant level, this impact (WS-2) would remain significant and unavoidable.

WS-3 REQUIRE OR RESULT IN THE RELOCATION OR CONSTRUCTION OF NEW OR EXPANDED WATER FACILITIES, THE CONSTRUCTION OR RELOCATION OF WHICH COULD CAUSE SIGNIFICANT ENVIRONMENTAL EFFECTS.

ANALYSIS METHODOLOGY

This analysis provides information on the adequacy of existing water facilities to serve forecasted regional growth and land use change and proposed transportation network improvements. *Water facilities* are defined to include conveyance (of raw water), storage, treatment, and distribution facilities. Major water conveyance systems serving the region include the California Aqueduct and Colorado River Aqueduct, and the system includes other conveyance pipelines and associated infrastructure. A significant impact would occur if forecasted regional growth and land use change or transportation network improvements and programs required construction, expansion, or relocation of water facilities that would result in significant physical impacts. To evaluate potential impacts, areas where growth and land use change or transportation network improvements and programs are expected to occur are compared to the existing capacity of water supply facilities identified in Section 4.18.1, *Existing Conditions*, to determine if implementation of the proposed Plan would require the construction of new or expanded water supply facilities in order to maintain water supply. Impacts of construction activities for new or expanded facilities are analyzed as well. As the timeframe analyzed

extends into the future, precise impact assessment is made difficult due to the age of the current SDCWA Facilities Master Plan, which dates to 2013 (SDCWA 2013).SDCWA's in-region storage includes the Olivenhain Reservoir, the San Vicente Reservoir, and Lake Hodges. In addition, SDCWA has contracted for out-of-region groundwater storage. Water treatment for almost all retail water service is provided by a member agency WTP, Twin Oaks Valley WTP, or by MWD's Skinner WTP. This regional treated-water capacity provides flexible and robust local water treatment options and supports member agencies' constructed facilities. Water demands associated with the proposed Plan's regional growth and land use change or transportation network improvements are discussed and then compared to the existing capacity of water facilities. A shortfall in capacity compared to future water demands would result in the need to construct additional facilities, resulting in new impacts.

The types of potential short- and long-term physical impacts of constructing and operating such facilities are described. Several existing water infrastructure projects and expansions are identified in the SDCWA's 2013 Master Plan Update to meet current and projected regional water demand. Specific major infrastructure plans and projects proposed by the local water supply agencies are described, along with a general assessment of potential impacts that would occur. Construction of new or expanded water facilities would be expected to result in short-term construction-related impacts on air quality, noise, traffic, hydrology, and other environmental resources.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Baseline water usage within the SDCWA service area in 2016 was 454,963 acre-feet, and the forecasted demand for 2025 is 618,169 acre-feet (SDCWA 2021b). This represents an increase of 163,206 acre-feet. New facilities and expansion of existing water facilities would be needed to serve 2025 growth, and to serve alternative water supply projects, if required, but details on the size, location, and characteristics of those facilities are not completely known and would be addressed in project-specific documents. The near-term projects recommended by the 2013 Master Plan Update for further evaluation are described above under Impact WS-1. Near-term projects specific to the 2025 planning horizon are noted below. The potentially significant construction-related environmental impacts of these facilities, and potential mitigation measures, are summarized in Table 4.18-18. This table specifically addresses the impacts for future water supply projects.

Table 4.18-18
Potential Environmental Impacts Associated with Water Supply Projects

Environmental Issue Area	Potential Significant Impact	Possible Mitigation
Aesthetic and Visual Resources	Construction activities may alter scenic views. Addition of new visual features may block views and cause additional sources of light and glare.	Protect public views of scenic vistas during all project stages. Design projects to reduce impacts on scenic resources within scenic highways. Design projects to reduce light and glare with project-specific design features.

Environmental Issue Area	Potential Significant Impact	Possible Mitigation
Air Quality	The following may occur: temporary construction air quality impacts; emission of toxic air contaminants; and conflict with local Air Quality Management Plan.	Comply with all applicable federal, State, and local air quality guidelines.
Biological Resources	Construction and operation activities may impact terrestrial and aquatic biological resources.	Comply with all federal, State, and local laws and guidelines to ensure protection of biological resources in all stages of the project.
Cultural, Tribal, and Paleontological Resources	Construction and operation activities may potentially disturb undiscovered tribal, archaeological, and paleontological resources.	Conduct preconstruction surveys, records searches, studies, and Native American consultations. Identify the potential for unique paleontological resources or unique geologic features. Develop project-level measures to avoid or reduce impacts on cultural resources, paleontological resources, and unique geologic features. Protect historic resources during construction.
Energy	Construction and operation of such facilities may increase energy usage.	Comply with all applicable federal, State, and local energy regulations and plans.
Geology, Soils, and Mineral Resources	The following may occur: seismic-related hazards including earthquakes; and geologic-related hazards including landslides and liquefaction, soil and topsoil erosion, and water and wind erosion.	Prepare project-specific geotechnical studies. Comply with the recommendations of site-specific studies as a condition of the site development permit for specific projects.
Greenhouse Gas (GHG) Emissions	Project may increase the emissions of GHGs.	Comply with all State and local regulations to reduce GHG emissions.
Hazards and Hazardous Materials	Project may create hazards due to the storage, transportation, and/or handling of hazardous materials, thereby increasing the risk of exposure to hazards and hazardous materials.	Handle, store, transport, and dispose of all hazardous materials in accordance with all applicable federal, State, and local regulations. Implement measures to ensure emergency response services are adequate and can meet service levels.

Environmental Issue Area	Potential Significant Impact	Possible Mitigation
		Implement bank stabilization and other wildland fire risk reduction measures.
Hydrology and Water Quality	Stormwater runoff and flooding may occur. Some projects may result in increased surface water diversions.	Comply with all applicable regulations and detailed erosion control measures tailored to the specific project site. Implement measures to manage stormwater runoff and erosion including directing runoff to permitted system with capacity.
Noise	Construction and operation may cause impacts on nearby sensitive receptors.	Comply with noise standards in the specific project jurisdiction, and prepare a Noise Study.
Public Services and Utilities	Increased solid waste production may occur.	Comply with all applicable regulations and Assembly Bill 939. Reduce water use for construction and operations. Implement green building measures. Reduce construction waste through reuse or recycling of materials.
Traffic	Short-term project construction could potentially impact traffic.	Develop and implement a Traffic Control Plan for specific projects to ensure safety in construction zones.
Wildfire	Short-term project construction in Very High Fire Severity Zones and the Wildland-Urban Interface could potentially increase wildfire risk.	Develop and implement a Fire Safety Plan and incorporate fire prevention BMPs to reduce wildfire risk.

The following near-term projects have an anticipated implementation timeframe of 2016–2025 (SDCWA 2013a):

- North County ESP Pump Station (Existing Project): This project consists of a new 30 cubic foot per second pump station to deliver treated water to the northern reaches of the SDCWA service area when supplies from MWD are interrupted. Project location and pumping capacity are dependent on implementation of the Pipeline 3/Pipeline 4 Conversion project (see discussion under *2035* below). This project is scheduled for completion in 2023 (SDCWA 2021a).
- Mission Trails Projects (Existing Project): This project will alleviate the existing untreated water conveyance constraint south of Lake Murray. The project provides regulatory storage for improved aqueduct operations and increases untreated water conveyance capacity for deliveries to south county WTPs. The project includes a new storage facility sized up to 12 million gallons, flow control valve structure, and connections to the completed Mission Trails Tunnel project. An alternative to this project would be constructing a new interconnection or placing the existing Flow Balancing Structure back in service, both which would only address the conveyance constraint south of Lake Murray. This project is currently under construction.

- System Isolation Valves: This project, which is currently nearing completion, allows for more efficient isolation of segments of the aqueduct system to perform required inspections, maintenance, and repair work and isolates segments of the aqueduct system during low flow periods to address potential water quality concerns. High-risk areas generally include river and stream crossings, lake crossings, and other areas where damage may result from a seismic or flood event.
- Facility Planning Studies (New Project): This project includes new planning-level studies that would evaluate infrastructure requirements related to the assessment of water quality concerns and nitrification in the treated water system, system vulnerabilities at river and stream crossings resulting from flood and seismic events, and the evaluation of new in-line hydroelectric generation opportunities.

Construction of new or expanded water facilities would result in short-term construction-related impacts. Construction-related impacts are typically controllable and can be mitigated below a level of significance through actions of the implementing agency, including adherence to existing regulations and BMPs. Additionally, operation of new facilities may lead to long-term environmental impacts related to air quality, noise, traffic, and more. Because details about the timing, location, and project-specific information for new water facilities are not known, there is no assurance the impacts from the construction or operation of new or expanded water facilities would always be less than significant. Therefore, this impact is significant.

Transportation Network Improvements and Programs

Transportation network improvements and programs are developed to accommodate the projected growth and increases in population, housing, and employment. New treatment and storage facilities would not be required to provide water for irrigated landscaping on proposed Plan transportation projects, because the water demands of these projects are relatively minor.

New or extended distribution pipelines would be needed to extend recycled water service to new projects where such service is not available, and the extension of recycled water is included in the Complete Corridor improvements to provide for landscape irrigation. Construction and operation of these recycled water distribution facilities would cause the types of environmental impacts listed in Table 4.18-18. Therefore, implementation of the proposed Plan transportation network improvements and programs would result in a significant impact related to construction of new water distribution facilities in 2025.

The construction of new transportation network improvements, including roadways, bicycle and pedestrian facilities, and transit facilities, and operation and maintenance of new facilities could increase the demand for water for construction activities such as concrete mixing and dust control, and operational activities and services such as restrooms and drinking fountains. Although these increases in demand are anticipated to be small on a per project basis, the collective demand from all of the projects taken together could increase water demand in such a way as to exceed current projected supply, requiring construction of new or expanded water facilities. These impacts are considered significant.

2025 Conclusion

Regional growth and land use change and transportation network improvements under the proposed Plan would result in construction of new or expanded water facilities. The impacts of constructing some of these facilities would be significant. Therefore, this impact (WS-3) in the year 2025 is significant.

2035

Regional Growth and Land Use Change

As noted above, the forecasted water demand in 2025 is 618,169 acre-feet, and the forecasted demand for 2035 is 671,509 acre-feet (SDCWA 2021a). This represents an increase of 53,340 acre-feet. As stated in the 2025 analysis, construction of new or expanded water facilities to serve the growth would result in short-term construction-related impacts. Construction-related impacts are typically controllable and can be mitigated below a level of significance through actions of the implementing agency, including adherence to existing regulations and BMPs. Operation of new facilities may lead to long-term environmental impacts related to air quality, noise, traffic, and more. Because details about the timing, location, and project-specific information for new water facilities are not known, there is no assurance the impacts from the construction of new or expanded water facilities would always be less than significant. Therefore, this impact is significant.

Implementation of the near-term projects would reduce SDCWA's potential conveyance constraints and supply shortages. The near-term projects with an anticipated implementation timeframe between 2026 and 2035 include (SDCWA 2013a):

- Pipeline 3/Pipeline 4 Conversion (New Project): This project will alleviate the potential untreated water conveyance constraint at the MWD Delivery Point. The project will increase untreated water conveyance capacity in the Second Aqueduct north of Twin Oaks Valley by converting an existing segment of Pipeline 4 to untreated water service and converting an existing parallel segment of Pipeline 3 to treated water service. Total untreated water delivery capacity would increase by 190 cubic feet per second. Coordination with MWD is required to determine new infrastructure requirements outside the SDCWA service area that will facilitate the conversion of Pipelines 3 and 4.
- ESP San Vicente 3rd Pump and Power Supply (Existing Project): This project provides station upgrades and a new power supply to allow operation of the existing pump station at full design capacity. The project is needed to fully utilize an expanded San Vicente Reservoir for emergency storage operation and provide operational flexibility to deliver additional supply from the reservoir to meet peak seasonal demands. New power supply options include a new 12 kilovolt (kV) overhead circuit or onsite power generation using diesel- or natural gas–powered generator sets.
- System Storage (Existing Project): This project provides new regulatory storage to manage daily flow changes and unanticipated flow interruptions. The project includes two possible locations: at the Twin Oaks Diversion Structure (sized 10 to 20 million gallons) and at the First Aqueduct/Valley Center Pipeline connection (sized 2 to 3 million gallons).

The significant construction-related environmental impacts of the near-term and long-term facilities, and potential mitigation measures, are summarized in Table 4.18-18. This table specifically addresses the impacts for future water supply projects.

Because details about the timing, location, and project-specific information are not known, there is no assurance the impacts from the construction or operation of new or expanded water facilities would always be less than significant. Therefore, this impact is significant.

Transportation Network Improvements and Programs

Transportation network improvements and programs are developed to accommodate the projected growth and increases in population, housing, and employment, as discussed above in the 2025 analysis. New treatment

and storage facilities would not be required to provide water for irrigated landscaping on proposed Plan transportation projects, because the water demands of these projects are relatively minor.

New or extended distribution pipelines would be needed to extend recycled water service to new projects where such service is not available, and the extension of recycled water is included in Complete Corridor to provide for landscape irrigation. Construction and operation of these recycled water distribution facilities would cause the types of environmental impacts listed in Table 4.18-18. Therefore, implementation of the proposed Plan transportation network improvements would result in a significant impact related to construction of new water distribution facilities in 2035.

The construction of new transportation network improvements, including roadways, bicycle and pedestrian facilities, and transit facilities, and operation and maintenance of new facilities could increase the demand for water for construction activities such as concrete mixing and dust control, and operational activities and services such as restrooms and drinking fountains. Although these increases in demand are anticipated to be small on a per project basis, the collective demand from all of the projects taken together could increase water demand in such a way as to exceed current projected supply, requiring construction of new or expanded water facilities . These impacts are considered significant.

2035 Conclusion

Regional growth and land use changes, along with implementation of transportation network improvements and programs would result in construction of new or expanded water facilities. Impacts of constructing some of these facilities would be significant. Therefore, this impact (WS-3) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

As noted above, the forecasted normal year water demand in 2035 is 671,509 acre-feet (SDCWA 2021a). The estimated normal year demand for 2050 is 817,821 acre-feet, an increase of 32,136 acre-feet. As stated in the 2020 and 2035 analyses, construction of new or expanded water facilities would result in short-term construction-related impacts. Construction-related impacts are typically controllable and can be mitigated below a level of significance through actions of the implementing agency, including adherence to existing regulations and best management practices, and, as stated in WS-1, no shortages are anticipated within the SDCWA's service area in a normal water year and single dry water year through 2045 (SDCWA 2021a), but some uncertainty exists for 2050 water supplies and facilities in the region. This uncertainty exists because the SDCWA's current UWMP (SDCWA 2021a) has a planning horizon of 2045 and the most recently prepared Facilities Management Plan dates to 2013 (SDCWA 2013). Future construction and operation of new facilities may lead to long-term environmental impacts related to air quality, noise, traffic, and more. Because details about the timing, location, and project-specific information for new water facilities are not known, there is no assurance the impacts from the construction of new or expanded water facilities will always be less than significant. Therefore, this impact is significant.

Transportation Network Improvements and Programs

By 2050, most of the transportation network improvements and programs associated with the proposed Plan would be in place and operational. The availability of water facilities to serve the increasing demand in 2050 is uncertain, and construction of new water facilities would cause the types of environmental impacts listed in Table 4.18-18. In some locations, new distribution pipelines would be needed to extend recycled water service

to new projects where such service is not available, and their construction and operation would cause the types of environmental impacts listed in Table 4.18-18. Therefore, implementation of the proposed Plan transportation network improvements would result in a significant impact related to construction of new water distribution facilities in 2050. This is a significant impact.

The construction and operation of new transportation network improvements, including roadways, bicycle and pedestrian facilities, and transit facilities, and operation and maintenance of new facilities could increase the demand for water. This would include water for construction activities such as concrete mixing and dust control, and operational activities and services such as restrooms and drinking fountains. Although these increases in demand are anticipated to be small on a per project basis, the collective demand from all of the projects taken together could increase water demand in such a way as to exceed current projected supply, requiring construction of new or expanded water facilities. These impacts are considered significant.

2050 Conclusion

Implementation of regional growth and land use change and transportation network improvements and programs would result in construction of new or expanded water facilities. Impacts of constructing some of these facilities would be significant. Therefore, this impact (WS-3) in the year 2050 is significant.

Exacerbation of Climate Change Effects

The proposed Plan could exacerbate climate change effects on potential relocation or construction of new or expanded water facilities. Climate change impacts that decrease water supplies, such as reduced precipitation, increased drought and evapotranspiration, and changes in snowpack melt timing (CEP and SDF 2015), may require construction of new water facilities in the future, such as reservoirs or treatment plants. Furthermore, climate change impacts such as increased wildfire and flooding risk could damage water facilities, requiring upgrades or new facilities to replace them. The proposed Plan's projected population growth would increase water demand, further straining existing water facilities and exacerbating the potential need for new ones.

MITIGATION MEASURES

WS-3 REQUIRE OR RESULT IN THE RELOCATION OR CONSTRUCTION OF NEW OR EXPANDED WATER FACILITIES, THE CONSTRUCTION OR RELOCATION OF WHICH COULD CAUSE SIGNIFICANT ENVIRONMENTAL EFFECTS.

2025, 2035, and 2050

Implement mitigation measures **WS-1a, WS-1b, WS-1c**, and **WS-2,** as described above.

WS-3 Implement Measures for New or Expanded Water Facilities. During planning, design, and project-level CEQA review of development projects and water projects, MWD, SDCWA, the County of San Diego, cities, and other local jurisdictions can and should apply necessary mitigation measures to avoid or reduce significant environmental impacts associated with the construction or expansion of new or expanded water facilities. Mitigation measures should be implemented by water management agencies directly responsible for the construction of new or expanded water facilities. Significant environmental impacts requiring mitigation may include but are not limited to air quality, noise, traffic, biological resources, cultural resources, paleontological resources, tribal cultural resources, energy, greenhouse gas emissions, hydrology and water quality, and water supply.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Implementation of the proposed Plan would result in significant impacts associated with the construction or expansion of water facilities in 2025, 2035, and 2050. Mitigation measures WS-1a, WS-1b, WS-1c, and WS-2, would reduce the impacts of project-specific construction or expansion of water facilities through reducing water demands, and through project-level planning, design, and CEQA mitigation measures. Mitigation measure WS-3 would require project-specific mitigation to be implemented for new or expanded water facilities. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less than significant level. Therefore, this impact (WS-3) would remain significant and unavoidable.

4.19 WILDFIRE

This section evaluates wildfire impacts that would result from implementation of the proposed Plan.

4.19.1 EXISTING CONDITIONS

Wildfire, as defined in California Public Resources Code Sections 4103 and 4104, is any uncontrolled fire spreading through vegetative fuels that threatens to destroy life, property, or resources. In the last two decades, wildfires in California have increased in number of fires ignited, number of acres burned, and number of structures destroyed (California State Board of Forestry and Fire Protection and CAL FIRE 2018). Since 2015, the average annual cost of fire suppression in California in areas under State jurisdiction has averaged over $550 million per year (CAL FIRE 2018a), and in 2016 (the most recent year reported) over four million dollars of wildfire-related damage occurred in San Diego County alone (CAL FIRE 2016). Of the top 20 largest California wildfires, three have been in San Diego County, including the 2003 Cedar Fire, which burned 273,246 acres, destroyed 2,820 structures, and resulted in the loss of 15 lives (CAL FIRE 2018b).

Several factors, including climate, native vegetation, topography, and development patterns make the San Diego region susceptible to wildfires. Extended droughts, characteristic of the region's Mediterranean climate and exacerbated by climate change, result in large areas of dry vegetation that provide fuel for wildland fires. Wildfire risk tends to be high in locations where dense vegetation occurs on a steep slope (CAL FIRE 2018c). As a result, high wildfire risk occurs in the hills and mountains of the eastern San Diego region where sparse development intermingles with fire-prone native vegetation. But urban areas can also be at risk where the unique mesa-canyon topography of coastal San Diego puts development in proximity to steep slopes and dense vegetation. After wildfire burns the vegetation that anchors soil to the hillside, chances increase that a flash flood, mudflow or landslide could occur in the event of heavy rains (CAL FIRE 2018d).

Development patterns contribute to wildfire risk in California as well. When communities are located in areas that burn frequently, wildfire smoke, which can travel for miles, has a negative effect on human health (Black et al. 2017). In addition, more wildfires are started near developed areas and near roadways (Syphard et al. 2007), and as development expands into wildland areas, more wildfires are ignited (Radeloff 2018). An estimated 80 percent of wildfires are ignited by humans (Balch et al. 2017). Humans start wildfires by leaving campfires unattended, burning debris, through equipment use and malfunctions, negligently discarding cigarettes, and intentional acts of arson (U.S. Forest Service 2017).

FIRE HAZARD DESIGNATIONS

The California Department of Forestry and Fire Protection (CAL FIRE) defines and maps Fire Hazard Severity Zones (FHSZ) to identify the potential fire hazard severity expected in different areas within the state as required by California Public Resources Code Sections 4201-4205. FHSZ are determined based on an area's vegetation, topography (slope), weather (including winds), crown fire potential, and ember production and movement potential. FHSZ include the classifications Very High, High or Moderate in areas where the State is responsible for fire protection (State Responsibility Areas [SRA]) (CAL FIRE 2018e). The majority of the San Diego region is included in an SRA for fire prevention and suppression (Figure 4.19-1).

FHSZ also include the classification Very High in areas where local agencies are responsible for fire protection (Local Responsibility Areas [LRA]) (CBSC 2016). In the San Diego region, local fire protection is provided by Fire Protection Districts and county Service Areas in unincorporated parts of the County, and by city fire departments and joint powers agreements within city boundaries. Local fire protection is discussed in more

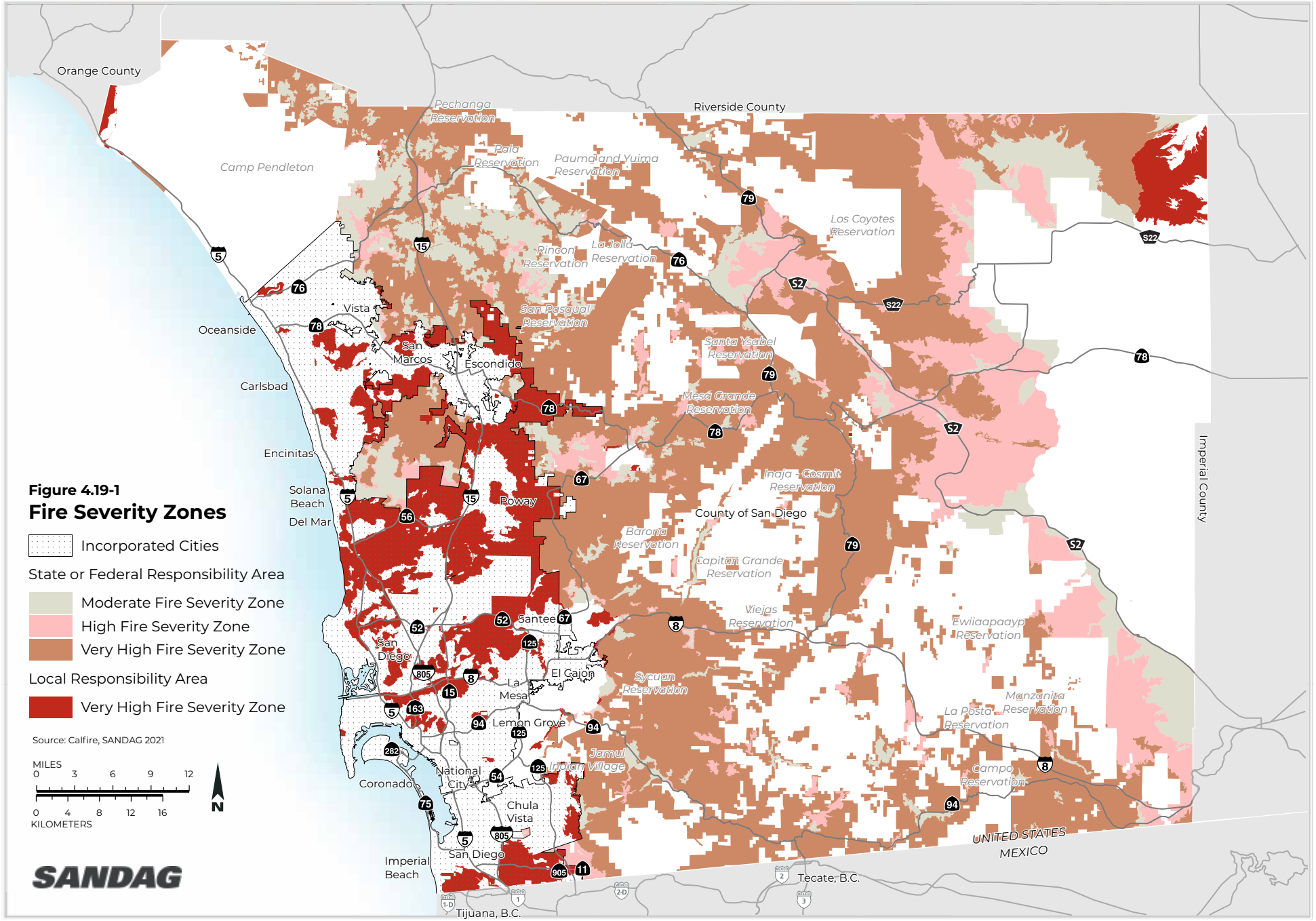
detail in Section 4.15, *Public Services and Utilities*. Approximately 32 percent of the San Diego region consists of areas that are designated as a Very High FHSZ (Table 4.19-1).

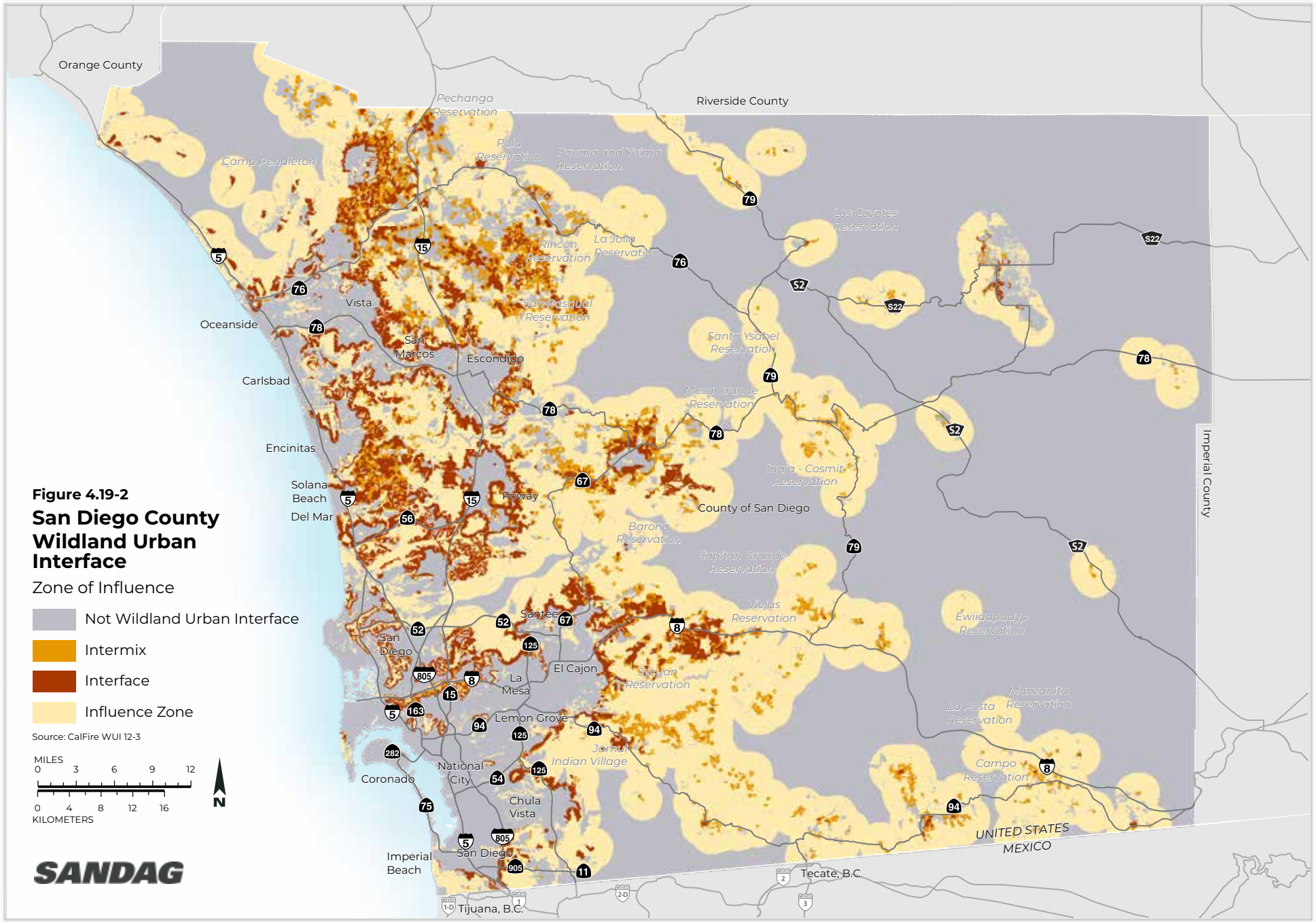
Table 4.19-1
Fire Risk in the San Diego Region

Threat	Acres	Percent of San Diego Region
Very High	867,162	32
High	121,577	4
Moderate	124,719	5
Little or no Hazard	23,793	1
Total	1,137,251	42

Source: CAL FIRE 2018a

The California Fire Code (California Code of Regulations [CCR] Title 24, Part 9), includes requirements for building construction and vegetation management within areas designated as Wildland Urban Interface (WUI) areas. WUI areas occur where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels (USDA and USDOI 2001a) and occur in areas designated by CAL FIRE as a FHSZ. A WUI is defined as a buffer around areas of residential density greater than 0.05 dwelling units per acre. Two additional classes are mapped, as shown in Figure 4.19-2, including Wildland Urban Intermix and Wildfire Influence Zone. Wildland Urban Intermix are areas of more sparsely populated development than WUI, but are interspersed in areas dominated by wildland vegetation subject to wildfire. A Wildfire Influence Zone includes all areas up to 1.5 miles from WUI for Wildland Urban Intermix with wildfire susceptible vegetation (CAL FIRE 2018f).


Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
La Jolla Reservation
Los Coyotes Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
La Posta Reservation
Manzanita Reservation
Jamul Indian Village
Campo Reservation
County of San Diego
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
San Diego
Imperial Beach
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO
Figure 4.19-1
Fire Severity Zones
Incorporated Cities
State or Federal Responsibility Area
Moderate Fire Severity Zone
High Fire Severity Zone
Very High Fire Severity Zone
Local Responsibility Area
Very High Fire Severity Zone
Source: Calfire, SANDAG 2021
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG


Orange County
Riverside County
Imperial County
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Camp Pendleton
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Jamul Indian Village
Campo Reservation
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Tecate, B.C.
Figure 4.19-2
San Diego County Wildland Urban Interface
Zone of Influence
Not Wildland Urban Interface
Intermix
Interface
Influence Zone
Source: CalFire WUI 12-3
MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N
SANDAG

ANTICIPATED EFFECTS OF CLIMATE CHANGE

Due to its semi-arid climate, shrubland, and the nearby presence of the Santa Ana winds, the San Diego region experiences wildfire, and the high temperatures and droughts caused by climate change could increase wildfire intensity or frequency. By 2050, the fire season in the San Diego region may be longer and less predictable, with larger and more catastrophic fires (CEP and SDF 2015), and climate change may drive factors that may worsen wildfires, such as more frequent and intense dry Santa Ana winds, drier autumns, and increased development and presence of dead fuels.

The annual average of acres burned in the San Diego region was 21,042 between 1950 and 2005. Under a high-emissions scenario, the Cal-Adapt wildfire tool anticipates an annual average 20,972 acres of burned land by 2050 (a negligible decrease) and 29,499 acres by 2100 (a 40 percent increase). Under a low-emissions scenario, the tool estimates an annual average of 17,971 acres burned by 2050 (a 14.6 percent decrease) and 24,546 acres by 2099 (a 16.6 percent increase) (County of San Diego 2018). Thus, climate change is expected to increase wildfire occurrence in the San Diego region over the long term, with risks increasing over time.

Wildfire risk could also interact with other climate hazards to create cascading events. Flooding (which is also expected to increase in the San Diego region due to an increase in extreme precipitation events) that occurs after a wildfire may result in mudslides due to excess runoff that washes away soils destabilized from wildfire (Bedsworth et al. 2018). These mudslides could also pose a hazard to people and structures in high fire-risk areas.

4.19.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

International Fire Code

Published by the International Code Council, the International Fire Code (ICC 2017) is a model upon which the current California Fire Code (24 CCR 9) is based. The IFC is the underlying nationally recognized code that sets standards and requirements to safeguard against the threat fires may pose to public health, safety, and the environment. The IFC, when adopted by a jurisdiction, regulates the planning, construction, and maintenance of development in all areas.

National Fire Plan

The Department of the Interior's National Fire Plan (USDOI 2000) is intended to guarantee an appropriate federal response to severe wildland fires, reduce fire impacts on rural communities, and ensure sufficient firefighting capacity in the future. The plan's Rural Fire Assistance program called for enhancing the fire protection capabilities of rural fire districts and safe and effective fire suppression in the "wildland-urban interface," which led to the further definition and identification of WUIs in the *Federal Register* (USDA and USDOI 2001b), and the use of the term in other federal and state plans. The program promotes close coordination among local, state, tribal, and federal firefighting resources by conducting training, purchasing equipment, and providing prevention activities on a cost-shared basis. As such, CAL FIRE incorporates concepts from this plan into local fire planning efforts.

The Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 (DMA 2000) (Public Law 106-390) provides the legal basis for Federal Emergency Management Act mitigation planning requirements for state, local and Indian Tribal governments as a condition of receiving national post-disaster Hazard Mitigation Grant Program (HMGP) funding. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions and replacing them with a new set of requirements that emphasize the need for state, local, and Indian Tribal entities to closely coordinate mitigation planning and implementation efforts. Section 322 of DMA addresses mitigation planning at the state and local levels. It identifies requirements that allow HMGP funds to be used for planning activities and increases the amount of HMGP funds available to states that have developed a comprehensive, enhanced mitigation plan prior to a disaster. States and communities must have an approved mitigation plan in place prior to receiving post-disaster HMGP funds.

U.S. Geological Survey Landslide Hazard Program

The U.S. Geological Survey created the Landslide Hazard Program (LHP) under the requirements of Public Law 106-113. The primary objective of the LHP is to reduce long-term losses from landslide hazards by improving the understanding of the causes of ground failure and suggesting mitigation strategies. The federal government takes the lead role in funding and conducting this research, whereas the reduction of losses due to geologic hazards is primarily a state and local responsibility.

Executive Order 13855

On December 2018, Executive Order (EO 13855 was issued, directing the U.S. Department of Agriculture (USDA) and U.S. Department of the Interior (DOI) to implement policies to improve forest management practices by reducing hazardous fuel loads, mitigating fire and post-fire risks and ensuring the safety of local communities. The Departments were directed to collaborate with state, tribal and local entities in creating a comprehensive wildfire strategy prioritizing the highest-risk lands. The EO contained acreage targets for fuel reduction and directives regarding the quantities of lumber to be thereby produced. Acreage targets were also provided for post-fire treatments to maintain water quality and prevent erosion. The order also prioritizes proper maintenance of public roads vital to conducting management activities.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

CAL FIRE Strategic Plan

CAL FIRE's Strategic Plan (CAL FIRE 2019) is intended to provide CAL FIRE with appropriate guidance for adequate statewide fire protection of State Responsibility Areas, in accordance with Public Resources Code (PRC) Section 4130. The plan addresses both wildfire prevention and suppression activities, and management of the state's forests to help meet California's climate change goals. The goals of the plan include improving CAL FIRE's core capabilities, enhancing internal operations, ensuring employee health and safety, and building an engaged, motivated, innovative workforce.

California Public Resources Code 4125-4137 (Responsibility for Fire Protection)

This statute requires the State Board of Forestry and Fire Protection to classify all State lands for the purpose of determining areas in which the financial responsibility of preventing and suppressing fires is primarily the responsibility of the State, or SRAs, and therefore under the jurisdiction of CAL FIRE. All State lands that are not classified as a SRA are considered to be the responsibility of local or federal agencies. SRAs include lands

capable of producing forest products; lands covered by timber, brush, undergrowth, or grass that protect the soil from erosion; and lands used for range or forage purposes.

SRA Fire Safe Regulations

CCR Title 14, Division 1.5, Section 1270 et seq. establishes CAL FIRE's basic wildland fire protection standards for new development and is applicable in all SRAs in California—areas where CAL FIRE is responsible for wildfire protection. Title 14 establishes minimum standards required for fire protection for emergency access, fuel modification (including a defensible space of 100 feet around structures), setback to property line, signage, and water supply. To comply with the standards, proposed development must include road and street networks that provide safe access for emergency wildland fire equipment and civilian evacuation concurrently. Newly constructed buildings and roads must post clearly visible signs, including names and contact numbers visible from the roadway. Emergency water for wildfire protection must be available and accessible in specified quantities. Finally, to reduce the intensity of a wildfire, strategic siting of fuel modification and greenbelts must meet specific requirements.

California Fire Code

The California Fire Code is Part 9 of the California Building Code (CBC), which is set forth in CCR Title 24. The California Fire Code is created by the California Building Standards Commission and is based on the International Fire Code created by the International Code Council and is revised and republished every 3 years. Chapter 49 of the California Fire Code defines requirements for building construction and vegetation and fuel management within Wildland-Urban Interface Fire Areas. In WUIs all new building must comply with California Fire Code standards defining wildfire protection building construction requirements intended to reduce wildfire exposure. In addition, buildings within the WUI must comply with California laws and regulations that require maintenance of a "defensible space" of 100 feet from structures (PRC Section 4291, CCR Section 1299.03).

California Public Resources Code 4201-4204 (Fire Hazard Severity Zones)

This statute directs CAL FIRE to map and periodically review FHSZs within SRAs, based on determining factors such as fuel loading, slope, and fire weather and winds. These FHSZs are the basis for identifying requirements for fire protection found in other regulations such as the California Fire Code.

Senate Bill 1241 (Kehoe) of 2012

Senate Bill 1241 (Chapter 311, Statutes of 2012) requires cities and counties to address fire risk in SRAs and Very High Fire Hazard Severity Zones (VHFHSZs) in the safety element of their general plans. It also requires cities and counties to make certain findings regarding available fire protection and suppression services before approving a tentative subdivision map or parcel map. The bill also resulted in amendments to the CEQA Guidelines Initial Study checklist to include questions related to fire hazard impacts for projects located in or near lands classified as SRAs and VHFHSZs.

Senate Bill 190 (Dodd) of 2019

Senate Bill 190 (Chapter 404, Statutes of 2019) includes a specific requirement for the State Fire Marshall to develop best models for defensible space and additional standards for home hardening and construction materials to increase the resilience of communities. The bill also requires the State Fire Marshall to develop

a Wildland-Urban Interface Fire Safety Building Standards Compliance training intended for use in the training of local building officials, builders, and fire service personnel.

Assembly Bill 38 (Wood) of 2019

Assembly Bill 38 (Chapter 391, Statutes of 2019) requires the Office of Emergency Services and the Department of Forestry and Fire Protection to develop best practices for community-wide resilience against wildfires through home hardening, defensible space, and other measures. In addition, sellers of real property located in a high or very high fire hazard severity zone will be required to provide specified documentation to the buyer that the property is in compliance with the wildfire protection measures.

Assembly Bill 836 (Wicks) of 2019

Assembly Bill 836 (Chapter 393, Statutes of 2019) establishes the Wildfire Smoke Clean Air Centers for Vulnerable Populations Incentive Pilot Program which will provide retrofits of air ventilation systems to create community clean air centers in order to mitigate the adverse public health impacts due to wildfires and other smoke events. The program will prioritize areas with high cumulative smoke exposure burden.

Assembly Bill 3074 (Friedman) of 2020

Assembly Bill 3074 (Chapter 259, Statutes of 2020) imposes additional fuel reduction requirements on a person who owns, leases, controls, operates, maintains or builds an occupied dwelling or structure in, upon, or adjoining wild lands within a very high fire hazard severity zone. This bill requires additional fuel clearance between 5 and 30 feet around the structure, and to create an ember-resistant zone within 5 feet of the structure, based on regulations promulgated by the State Board of Forestry and Fire Protection. Application of these regulations would be the responsibility of the local agency having jurisdiction over the property and the Department of Forestry and Fire Protection.

Senate Bill 85 (Skinner) of 2021

This $536 million appropriations bill substantially enhances the budget of the State Department of Forestry and Fire Protection. It charges the State Office of Emergency Services to develop criteria and reporting procedures regarding the pre-positioning of fire-fighting resources prior to the inception of the fire season. It makes grants of $12 to $15 million to multiple State department charged with land management responsibilities to fund fuel reduction and vegetation management efforts. It makes similar grants of $2 to $3 million to multiple land conservation entities. It provides almost $200 million for Fire Prevention Grants to local communities. It sets aside funds for local assistance in instances when federal reimbursement funds are delayed.

Board of Forestry and Fire Protection Review of Safety Elements

At least 90 days prior to the adoption or amendment of their safety element, counties that contain SRAs and cities or counties that contain VHFHSZs must submit their safety element to the Board of Forestry and Fire Protection (Government Code Section 65302.5(b)). The Board reviews the safety element and responds to the city or county with its findings and recommended changes regarding the uses of land and policies in SRAs or VHFHSZs that will protect life, property, and natural resources from unreasonable risks associated with wildfires, and the methods and strategies for wildfire risk reduction and prevention within SRAs or VHFHSZs (Government Code Section 65302.5 (b)(3).) The Board of Supervisors or City Council must consider the Board's recommendations and respond to the Board in writing if any of the recommendations are not accepted.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

County of San Diego Consolidated Fire Code

The County of San Diego Consolidated Fire Code (County of San Diego 2017) adopts, by reference, the California Fire Code (24 CCR 9) every 3 years when it is revised and republished. The Consolidated Fire Code consists of local Fire Protection District ordinances that have modified the Fire Code portion of the State Building Standards Code and any County of San Diego modification to the Fire Districts' amendments. The purpose of the Consolidated Fire Code is to protect the public health and safety, which includes permit and inspection requirements for the installation, alteration, or repair of new and existing fire protection systems, and penalties for violations of the Consolidated Fire Code. The Consolidated Fire Code provides the minimum requirements for access, water supply and distribution, construction type, fire protection systems, and vegetation management.

County of San Diego Code of Regulatory Ordinances Sections 96.1.005 and 96.1.202

The San Diego County Fire Authority (CFA), in partnership with CAL FIRE, the Bureau of Land Management, and the U.S. Forest Service, is responsible for defensible space inspections. Inspectors are responsible for ensuring that adequate defensible space has been created and maintained around structures. If violations of the program requirements are noted, inspectors itemize required corrective measures and provide a reasonable time frame in which to remediate the violations. If violations still exist upon re-inspection, the local fire inspector will forward a notice of violation to the County for further enforcement action.

Municipal Fire Codes

Each of the 18 cities in the San Diego region has a Fire Code included in its Municipal Code. Like the County of San Diego Consolidated Fire Code, these codes all adopt by reference the California Fire Code with amendments that specify details such as local authority and contact information. Although all municipalities require compliance with California Fire Code vegetation management requirements for creating defensible space around structures, some municipalities include additional specifications for vegetation management such as a preference for using native vegetation, and special requirements for sensitive habitat or water conservation.

San Diego County Fire Authority Strategic Plan 2020–2025

Since 2013 the CFA transitioned from a largely volunteer force to a professional department staffing 35 stations with responsibility for 1.5 million acres in the unincorporated area of the County. In 2019 the CFA finalized its first 5-year plan (County of San Diego Fire Authority 2019). The plan has four goals related to: (1) Employee Health and Professional Development, (2) Exceptional Emergency Services, (3) Resilient Communities, and (4) Organizational Excellence and Fiscal Responsibility. Each goal has multiple objectives. Most relevant are those under Resilient Communities. These objectives are to:

- Develop and implement a more cohesive pre-fire strategy to achieve resilient communities
- Reduce potential for loss in existing structures
- Strengthen fire safety measures in new construction
- Enhance pre-fire vegetation management
- Improve pre-fire emergency planning

San Diego Gas & Electric Company's Wildfire Mitigation Plan

San Diego Gas & Electric Company (SDG&E), in accordance with California Senate Bill 901, developed a Wildfire Mitigation Plan (SDG&E 2019) to provide a plan that describes the preventive strategies and programs SDG&E plans to adopt to minimize the risk of its electrical lines and equipment causing catastrophic wildfires. The plan includes a risk analysis; a description of wildfire prevention strategies and programs undertaken by SDG&E; and details related to inspections, system hardening, and emergency preparedness.

City and County General Plans

Local planning policies related to wildfire are established in each jurisdiction's general plan. Safety elements are required to address fire hazards, evacuation routes, and emergency response. As of January 1, 2013, Senate Bill 1241 of 2012 required that within 2 years of implementation of the next Regional Transportation Plan, upon the next revision of the housing element, jurisdictions review and update the safety element as necessary to address the risk of fire in SRAs and VHFHSZs. These revisions must consider the provisions outlined in "Fire Hazard Planning" by OPR (OPR 2015) and must include a number of specified content areas such as fire hazard mapping; historical data on wildfires; identification of agencies with responsibility for fire protection; and goals, policies, and objectives for the protection of the community from the unreasonable risk of wildfire.

Local General Plan wildfire policies included in the safety elements are summarized in Table 4.19-2.

Table 4.19-2
Local General Plan Wildfire Policies

Jurisdiction	General Plan Wildfire Policies
City of Carlsbad	General Plan updated in September 2015. Housing Element updated in 2017. Safety Element wildfire updates required by SB 1241 not completed to date. Wildfire is mentioned in the Safety Element as part of the San Diego County Multi-Jurisdictional Hazard Mitigation Plan.
City of Chula Vista	General Plan updated in December 2005. Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date. Wildfire is not mentioned in the Safety Element.
City of Coronado	General Plan updated in December 2005. Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date. The Safety Element states that wildfire is not a concern on Coronado because it is a developed urban peninsula surrounded by the Pacific Ocean.
City of Del Mar	General Plan updated in 1985. Housing Element updated in 2013. Safety Element ~~wildfire updates required by SB 1241 not completed to date.~~updated in 2019. Wildfire is ~~not mentioned in the~~listed as a "potential hazard" in the Safety Element.
City of El Cajon	General Plan updated in January 2001. Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date. Wildfire is mentioned in the Safety Element with reference to adoption of the San Diego County Multi-Jurisdictional Hazard Mitigation Plan.
City of Encinitas	General Plan updated in 1991. Housing Element updated in 2007. Safety Element wildfire updates required by SB 1241 not completed to date. Wildfire measure in the existing Public Safety Element:

Jurisdiction	General Plan Wildfire Policies
	Policy 1.13: In areas identified as susceptible to brush or wildfire hazard, the City shall provide for construction standards to reduce structural susceptibility and increase protection. Brush clearance around structures for fire safety shall not exceed a 30-foot perimeter in areas of native vegetation or significant brush, and as provided by Resource Management Policy 10.1.
City of Escondido	General Plan updated in 2012, Housing Element updated in 2013. Safety Element reflects wildfire updates required by SB 1241. Wildland Fire Hazards Policies: 2.14: Require new development in high wildfire risk areas to incorporate site design, maintenance practices, and fire-resistant landscaping to protect properties and reduce risks. 2.14: Continue to remove excessive/overgrown vegetation from city-owned properties and require private property owners to remove excessive/overgrown vegetation to the satisfaction of the Fire Department, to prevent and minimize fire risks to surrounding properties. 2.16: Require fire protection plans for mitigation of potential grass and wildland fires within designated high fire hazard areas and other areas required by the Fire Department, that address the need for fire systems, water availability, secondary emergency access routes, construction requirements, and fire-resistant landscaping and appropriate defensible space around structures. 2.17: Maintain programs to minimize impacts on sensitive biological habitat and species when suppressing wildland fires, when feasible. 2.18: Educate the public about wildland fire prevention techniques to minimize the potential hazards of wildland fires.
City of Imperial Beach	General Plan updated in 2015, Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date. The Safety Element of the General Plan identifies urban fires as the primary concern in Imperial Beach.
City of La Mesa	General Plan updated in 2012, Housing Element updated in 2012. Safety Element wildfire updates required by SB 1241 not completed to date. Wildfire is mentioned in the Safety Element with reference to adoption of the San Diego County Multi-Jurisdictional Hazard Mitigation Plan. Wildfire Policies: Objective SE-4.2: Minimize the risk of wildfires in developed areas of the City. Policy SE-4.2.1: Continue current practice of weed abatement in brush areas that are vulnerable to wildfire. Policy SE-4.2.2: Continue to participate in Zone, County, and State mutual and automatic aid agreements that support mitigation of wildfire hazards.
City of Lemon Grove	General Plan updated in 2012, Housing Element updated in 2012. Safety Element wildfire updates required by SB 1241 not completed to date. The Safety Element of the General Plan states that the probability of wildfire in Lemon Grove is extremely low, and that the City's Safety Element does not address it.
City of National City	General Plan updated in 2012, Housing Element updated in 2012. Safety Element wildfire updates required by SB 1241 not completed to date. Wildfire-related Policies (included under Fire and Emergency Medical Services): S-3.1: Add or expand fire stations and equipment as necessary and as fiscal and staffing resources allow, ensuring adequate fire response coverage.

Jurisdiction	General Plan Wildfire Policies
	S-3.2: Ensure daily staffing needs are met for the City's fire stations in order to achieve service standards, as fiscal resources allow. S-3.3: Consult with the Sweetwater Authority to upgrade water mains and install fire hydrants as necessary. S-3.4: Maintain and enforce standards for weed and brush abatement to provide clearances around structures and minimize fire hazard risk. S-3.5: Enforce the City's fire code including minimum road width standards for fire equipment access. S-3.6: Support housing rehabilitation programs that reduce structural fire risks due to heating or electrical problems. S-3.7: Promote fire prevention through public education programs.
City of Oceanside	General Plan updated in 2002, Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date. Fire Prevention Measures related to Natural Hazards in the General Plan: 1. Weed and Rubbish Abatement – City Council can order removal of brush and rubbish after declaring such to be a hazard to the public welfare. 2. Suppression and Control of Hazardous Fire Areas – Special provisions limit activities and require brush removal within hazardous fire areas. 3. Construction of Firebreaks – Each year a 75 to 100-foot firebreak is constructed by Camp Pendleton along the Oceanside-Camp Pendleton boundary. This firebreak, in conjunction with the efforts of the Camp's eight engine companies (117 personnel) has been successful in preventing fires from spreading from Camp Pendleton to the City.
City of Poway	General Plan updated in 1991, Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date. Strategies included under Policy B – Fire Protection: 1. Encourage the development, implementation and public awareness of fire prevention programs. 2. Implement programs to reduce the quantity of combustible vegetative materials in the City to reduce wildland fire hazards including a brush management program subject to approval by the City. 3. Continue the use of the Weed Abatement Program and a fire buffer program along heavily traveled roads through thinning, disking or controlled burning, subject to air quality standards. Brush, but not trees, should be cleared from both sides of major arterials. 4. The existing rows of eucalyptus trees should be trimmed periodically, and combustible vegetative materials at the tree base should be periodically removed. 5. All proposed development shall satisfy the minimum structural fire protection standards contained in the adopted editions of the Uniform Fire and Building Codes; however, where deemed appropriate the City shall enhance the minimum standards to provide optimum protection. 6. Fire protection requirements shall be expanded where structural and/or capital improvements cannot adequately protect the community from property damage or potential loss of life. 7. Study the feasibility of regulations requiring the installation of a sprinkler system at the time of construction of new residential structures and in conjunction with expansion or substantial interior remodeling of existing structures.

Jurisdiction	General Plan Wildfire Policies
	8. Require fire retardant roofing materials based upon the type of construction in and outside of high fire hazard areas. 9. Enforce the fire control requirements of the City's landscape standards. 10. In order to minimize fire hazards, the Poway Fire Department shall routinely be involved in the review of development applications. Consideration shall be given to adequate emergency access, driveway widths, turning radii, fire hydrant locations and needed fire flow requirements. 11. Advocate and support State legislation which would provide tax incentives encouraging the repair or demolition of structures which are classified as high fire hazards. 12. The construction of public facilities and transportation corridors shall be consistent with the adopted standards of the Uniform Building Code and Uniform Fire Code.
City of San Diego	General Plan updated in 2008, Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date.
City of San Marcos	General Plan updated in 2012, Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date. Goal S-3, Minimize injury, loss of life, and damage to property resulting from structural or wildland fire hazards, includes policies: S-3.1: Require development to be located, designed and constructed to provide adequate defensibility and reduce the risk of structural loss and life resulting from wildland fires. Development will consider hazards relative to terrain, topography, accessibility and proximity to vegetation. One such provision for development to minimize the risk of structural loss and life shall be the inclusion of overhead fire sprinklers. Policy S-3.2: Provide sufficient level of fire protection service to reduce risk from urban and wildland fire. Advocate and support regional coordination among fire protection and emergency service providers. Policy S-3.3: Require development to provide additional access roads when necessary to provide for safe access of emergency equipment and civilian evacuation concurrently. Policy S-3.4: Coordinate with fire protection and emergency service providers to assess fire hazards before and after wildfire events to adjust fire prevention and suppression needs, as necessary, commensurate with both short and long term fire prevention needs.
City of Santee	General Plan updated in2011, Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date. The General Plan states that the City of Santee Fire Department administers a weed abatement ordinance to reduce the risk of structural damage from wildfires. In the spring, the Fire Department inspects the entire City and notifies property owners to clear a defensible space around structures, and to clear undeveloped lots of weeds. If owners do not voluntarily clear the property, the City can direct the work to be done via a private contractor at owner's expense.
City of Solana Beach	General Plan updated in 2012, Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date. Objective 4.0, Establish fire prevention regulations and standards to minimize potential fire hazards and fire losses. Policy 4.a: The city shall enact an ordinance which establishes criteria for land development in hillside areas with emphasis on fire-retardant construction materials, access for fire-fighting personnel and equipment, removal of

Jurisdiction	General Plan Wildfire Policies
	combustible vegetation, and minimizing the overall exposure to risks associated with wildfires and adjacent structure fires. Policy 4.b: The city shall enact an ordinance which establishes structural design standards to ensure adequate fire safety. Policy 4.c: The city shall ensure that development is phased properly in relation to the city's ability to provide an adequate level of fire protection. Policy 4.d: The city shall establish appropriate measures to mitigate potential fire hazards in areas of special concern. Policy 4.e: The city Fire Department shall review proposed site plans to ensure that adequate fire safety measures are provided. Policy 4.f The city will participate with other communities in mutual aid agreements to ensure effective cooperation among fire agencies.
City of Vista	General Plan updated in 2012, Housing Element updated in 2013. Safety Element wildfire updates required by SB 1241 not completed to date. PSFS Goal 5: Protect life, property, and the environment from structural, wildland- urban, and wildland fire damage. PSFS Policy 5. 3.: Require development or projects within very high, high, or moderate fire zones, as designated by the City' s Fire Hazard Severity Zones Map, to comply with regulations and /or implement measures to mitigate the risk to life and structures from intrusion of fire from wildland fire exposures and fire exposures from adjacent structures, and to mitigate structure fires from spreading to wildland fuels. This may include, but is not limited to: a. Preparing fire protection plans. b. Creating and maintaining defensible space and vegetation management. c. Planting and maintaining fire - resistant landscaping. d. Using fire - resistant building materials and construction techniques. e. Ensuring adequate water supply and fire flow. f. Providing adequate circulation, emergency access, and property addressing and road identification. PSFS Policy 5. 2: Periodically update fire hazard studies and Fire Hazard Severity Zones Maps, and update or develop regulations and codes as appropriate. PSFS Policy 5. 3: Conduct community -wide awareness and education efforts concerning defensible space planning, maintenance, ignition- resistant construction, and landscaping techniques, with a focus on the areas within the Very High Fire Hazard Severity Zone. PSFS Policy 5. 4: Through the development review process, ensure that water main capabilities are adequate to meet fire flow requirements to the satisfaction of the Vista Irrigation District and Fire Department for all new development. PSFS Policy 5. 5: Pursue funding to implement fire protection measures at the City- and project - specific level. PSFS Policy 5. 6: Work with the Vista Fire Protection District and the County to ensure that development within fire hazard areas in the SOI complies with site design and property maintenance standards to reduce the risk of wildfires. PSFS Policy 5. 7: Maintain the City' s Vegetation Management Program to reduce wildfire hazards in urban and semi -urban areas within Vista. Thinning, pruning or removal of native vegetation under this program shall require approval of the Fire Marshal and the appropriate resource agencies if not permitted under existing agreements.
County of San Diego	General Plan updated in 2011. Safety Element wildfire updates required by SB 1241 not completed to date.

Jurisdiction	General Plan Wildfire Policies
	GOAL S-3 Minimized Fire Hazards. Minimize injury, loss of life, and damage to property resulting from structural or wildland fire hazards. Policies S-3.1 Defensible Development. Require development to be located, designed, and constructed to provide adequate defensibility and minimize the risk of structural loss and life safety resulting from wildland fires. S-3.2 Development in Hillsides and Canyons. Require development located near ridgelines, top of slopes, saddles, or other areas where the terrain or topography affect its susceptibility to wildfires to be located and designed to account for topography and reduce the increased risk from fires. S-3.3 Minimize Flammable Vegetation. Site and design development to minimize the likelihood of a wildfire spreading to structures by minimizing pockets or peninsulas, or islands of flammable vegetation within a development. S-3.4 Service Availability. Plan for development where fire and emergency services are available or planned. S-3.5 Access Roads. Require development to provide additional access roads when necessary to provide for safe access of emergency equipment and civilian evacuation concurrently. S-3.6 Fire Protection Measures. Ensure that development located within fire threat areas implement measures that reduce the risk of structural and human loss due to wildfire. Mitigation measures include, but are not limited to, the use of ignition resistant materials, multiple ingress and egress routes, and fire protection systems. S-3.7 Fire Resistant Construction. Require all new, remodeled, or rebuilt structures to meet current ignition resistance construction codes and establish and enforce reasonable and prudent standards that support retrofitting of existing structures in high fire threat areas. GOAL S-4 Managed Fuel Loads. Managed fuel loads, including ornamental and combustible vegetation. Policies S-4.1 Fuel Management Programs. Support programs and plans, such as Strategic Fire Plans, consistent with State law that require fuel management/modification within established defensible space boundaries and when strategic fuel modification is necessary outside of defensible space, balance fuel management needs to protect structures with the preservation of native vegetation and sensitive habitats. S-4.2 Coordination to Minimize Fuel Management Impacts. Consider comments from CAL FIRE, U.S. Forest Service, local fire districts, and wildlife agencies for recommendations regarding mitigation for impacts to habitat and species into fuel management projects. S-4.3 Forest Health. Encourage the protection of woodlands, forests, and tree resources and limit fire threat through appropriate fuel management such as removal of dead, dying, and diseased trees. GOAL S-5 Regional Fire Protection. Regional coordination among fire protection agencies. Policies S-5.1 Regional Coordination Support. Advocate and support regional coordination among fire protection and emergency service providers.

Jurisdiction	General Plan Wildfire Policies
	S-5.2 Fire Service Provider Agreements. Encourage agreements between fire service providers to improve fire protection and to maximize service levels in a fair, efficient, and cost effective manner. S-5.3 Reassessment of Fire Hazards. Coordinate with fire protection and emergency service providers to reassess fire hazards after wildfire events to adjust fire prevention and suppression needs, as necessary, commensurate for both short and long term fire prevention needs. GOAL S-6 Adequate Fire and Medical Services. Adequate levels of fire and emergency medical services (EMS) in the unincorporated County. Policies S-6.1 Water Supply. Ensure that water supply systems for development are adequate to combat structural and wildland fires. S-6.2 Fire Protection for Multi-Story Development. Coordinate with fire services providers to improve fire protection services for multi-story construction. S-6.3 Funding Fire Protection Services. Require development to contribute its fair share towards funding the provision of appropriate fire and emergency medical services as determined necessary to adequately serve the project. S-6.4 Fire Protection Services for Development. Require that new development demonstrate that fire services can be provided that meets the minimum travel times identified in Table S-1 (Travel Time Standards from Closest Fire Station). S-6.5 Concurrency of Fire Protection Services. Ensure that fire protection staffing, facilities and equipment required to serve development are operating prior to, or in conjunction with, the development. Allow incremental growth to occur until a new facility can be supported by development.

4.19.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines provides criteria for determining the significance of a project's environmental impacts, in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the checklist questions that address the criteria in CEQA Guidelines Appendix G. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR and the unique characteristics of the proposed Plan.

Checklist questions for wildfire are included in Section XX of Appendix G. For purposes of this EIR, the Appendix G questions have been combined and modified. Specifically, Appendix G Section XX question (a) is addressed in criterion HAZ-4 in Section 4.9, *Hazards and Hazardous Materials*. Question (b) is addressed in WF-1. Question (c) is addressed in WF-2. Question (d) is addressed in criterion WF-3. Appendix G Section IX, Hazards and Hazardous Materials, includes one question (g) pertaining to wildfire risk, which has been incorporated into WF-3 in this section, and not included in the Hazards and Hazardous Materials discussion. Per Appendix G Section XX, the analysis of wildfire impacts considers proposed Plan Areas located in or near SRAs or lands classified as VHFHSZ; however, because most of the San Diego region is located in or near these areas, the entire region is considered in the analysis.

Implementation of the proposed Plan, where located in or near SRAs or lands classified as VHFHSZs, or in other areas within the San Diego region, would have a significant wildfire impact if it would:

WF-1	Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire; or expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.
WF-2	Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.
WF-3	Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

4.19.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

WF-1 DUE TO SLOPE, PREVAILING WINDS, AND OTHER FACTORS, EXACERBATE WILDFIRE RISKS, AND THEREBY EXPOSE PROJECT OCCUPANTS TO POLLUTANT CONCENTRATIONS FROM A WILDFIRE OR THE UNCONTROLLED SPREAD OF A WILDFIRE; OR EXPOSE PEOPLE OR STRUCTURES, EITHER DIRECTLY OR INDIRECTLY, TO A SIGNIFICANT RISK OF LOSS, INJURY OR DEATH INVOLVING WILDLAND FIRES

ANALYSIS METHODOLOGY

This section analyzes the types of conditions under which the regional growth and transportation network components of the proposed Plan would exacerbate wildfire risks, expose people to pollution concentrations from a wildfire, or expose people or structures to a significant risk of loss, injury, or death involving wildfires. Geographic Information System analysis is used to identify forecast regional growth and land use change and planned transportation network improvements in Very High Fire Hazard Severity Zones (VHFHSZs) within SRAs and LRAs. VHFHSZs are areas in which slopes, prevailing winds, and other factors are conducive to wildfire risk. Where the analysis identifies exacerbated wildfire risks, it then examines whether such exacerbated wildfire risks would expose people or structures to (1) pollutant concentrations from a wildfire or (2) the uncontrolled spread of a wildfire. A significant impact would occur if forecast regional growth and land use change or planned transportation network improvements would either exacerbate wildfire risk and expose people or structures to wildfire pollutant concentrations, or if there is risk of uncontrolled spread of a wildfire due to the exacerbated wildfire risk.

CAL FIRE FHSZ mapping takes into consideration vegetation, topography (slope), weather (including winds), crown fire potential, and ember production and movement (CAL FIRE 2018c); therefore, these data were used to identify areas likely to have slope, winds, and other factors that could exacerbate fire risks if developed. Impacts were calculated by overlaying the forecast regional growth and land use footprint, and the transportation network improvements footprint onto mapped CAL FIRE data for VHFHSZs in the San Diego region. Acres of each footprint that would expand into the VHFHSZs are quantified and identified as areas where wildfire risk could be exacerbated.

2025

Regional Growth and Land Use Change

From 2016 to 2025, regional growth is forecast to result in an increase of 161,338 people (4.8 percent), 97,661 housing units (5.9 percent), and 115,328 jobs (7 percent). Approximately 78.8 percent of the 2025 population growth would occur within the cities of San Diego (57.9 percent), Chula Vista (12.1 percent), and Escondido

(8.8 percent). Collectively, these three jurisdictions would accommodate approximately 78 percent of new housing units and 63 percent of new jobs between 2016 and 2025.

Substantial regional growth and land use change is forecast throughout the San Diego region between 2016 and 2025. Regional growth and land use change would occur in the form of new residential development, services, commercial areas, industrial centers, schools, and civic uses. As shown on Figures 4.19-1 and 4.19-2, much of San Diego region is subject to wildland fire hazards. While most regional growth and land use change forecast would consist of infill, development on the edges of urban areas and in outlying areas has the potential to increase the threat of wildland fires on human populations and property, as development may be located closer to and within the WUIs and VHFSZs. It is forecast that, between 2016 and 2025, a total of 6,070 acres of new development would occur within the SRA. More than half of this development, 3,433 acres, would occur on land within the SRA classified as a VHFSZ. A total of 3,222 acres of new development is forecast within the LRA. All 3,222 acres would occur on land classified as a VHFSZ.

The expansion of the WUI by new development would occur throughout the region, –but increases in development between 2016 and 2025 are forecast in San Marcos, Escondido, Ramona, Julian, Santee, Alpine, and, above all, eastern Chula Vista (Figure 4.19-3). These portions of the region have greater fire danger due to expansive areas of native vegetation and slopes that would fuel and accelerate a fire. Aside from the less developed areas in the eastern portion of the region, the western portion of the region is also at high risk for fire hazards as it contains hundreds of miles of WUI due to the multitude of canyons throughout the area. Development along the canyon rims places structures in proximity to natural vegetation. Because of these existing land characteristics, around which many communities are formed, new growth and development in the interface areas may expose additional people and structures to a significant risk of loss, injury, or death involving wildland fires. In addition, growth experienced between 2016 and 2025 may result in an increased demand for fire protection services and increased demand on the existing water supply. In the event of a major wildland fire, the lack of available fire response staff or adequate response times, or infrastructure constraints such as insufficient water supply, may also contribute to an increased risk of wildland fire hazard.

Wildland fires may result in immediate damage to infrastructure such as buildings and facilities, and long-term damage from loss of forest or vegetation structure that may lead to erosion and unstable surfaces. The provision of defensible space would create a separation zone between wildlands and structures. Any development or redevelopment constructed adjacent to wildlands in the WUI zone would be obligated to conform to the statutory and regulatory requirements discussed in Section 4.19.2, *Regulatory Setting*. These include specific fire code requirements, including ignition-resistant construction with exterior walls of noncombustible or ignition-resistant material from the surface of the ground to the roof system. Other fire-resistant measures would be applied to eaves, vents, windows, and doors to avoid any gaps that would allow intrusion by flame or embers.

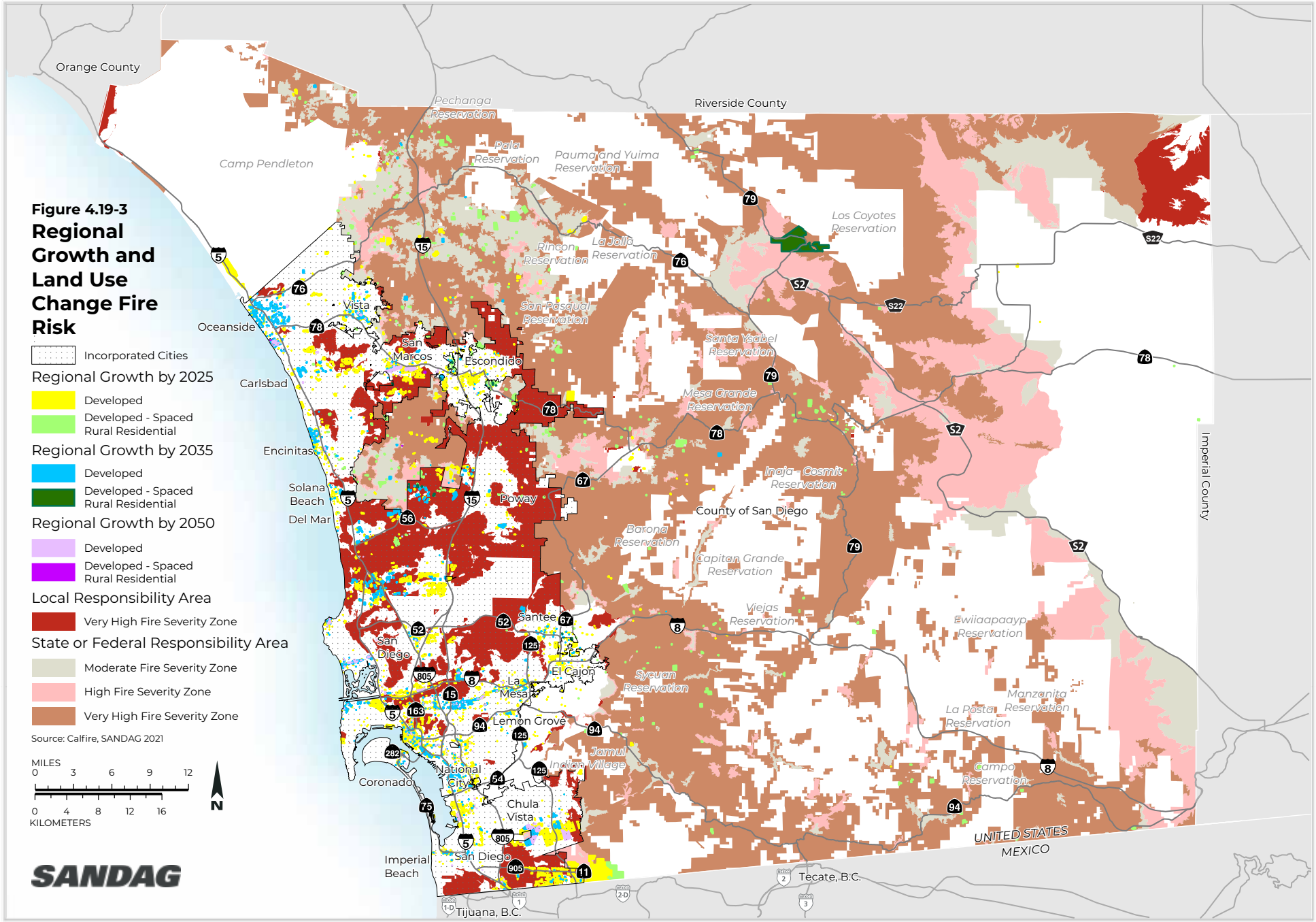


Figure 4.19-3
Regional Growth and Land Use Change Fire Risk
Incorporated Cities
Regional Growth by 2025
Developed
Developed - Spaced Rural Residential
Regional Growth by 2035
Developed
Developed - Spaced Rural Residential
Regional Growth by 2050
Developed
Developed - Spaced Rural Residential
Local Responsibility Area
Very High Fire Severity Zone
State or Federal Responsibility Area
Moderate Fire Severity Zone
High Fire Severity Zone
Very High Fire Severity Zone
Source: Calfire, SANDAG 2021
MILES 0 3 6 9 12
0 4 8 12 16 KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
Camp Pendleton
Pechanga Reservation
Pala Reservation
Pauma and Yuima Reservation
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Jamul Indian Village
Campo Reservation
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
County of San Diego
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO

In addition to the risks to people and property posed by the actual wildland fire, the smoke generated by wildland fires exposes county residents to harmful pollution concentrations and would do so in the future. This pollution exposure is exacerbated in Southern California by the weather conditions prevalent during the peak period of wildfire risk. Dry gusty Santa Ana winds accelerate and warm as they descend towards sea level. These winds fan and spread wildfires burning in the WUI and transport smoke to densely populated coastal areas. Wildfires propelled by Santa Ana winds can spread faster and burn longer than fires at other times of the year (Aguilera et al. 2021). Smoke particles vary in size, but up to 90 percent of wildfire smoke consists of fine particles (i.e., particulate matter less than 2.5 microns in size [PM2.5]) (Center for Disease Control 2019). Wildfires have the potential to suddenly increase PM2.5 concentrations, often surpassing safe limits and reaching levels qualified as hazardous. Sudden increases in PM2.5 levels caused by wildfire smoke can particularly affect vulnerable populations such as children and the elderly. Wildfire-specific PM2.5 can have greater impacts on respiratory health than PM2.5 from other sources, as it has been found to be up to 10 times more harmful than non-smoke PM2.5 (Aguilera et al. 2021). In healthy persons, the PM2.5 increases can cause respiratory symptoms, transient reductions in lung function, and pulmonary inflammation. Among less healthy individuals short-term exposures (i.e., days to weeks) to fine particles are associated with aggravation of pre-existing respiratory and cardiovascular disease resulting in increased risk of premature mortality (Center for Disease Control 2019). A recent study suggests that the airborne PM2.5 can carry harmful microbes as evidenced by an increase in fungal infections in areas characterized by recent wildfires (Kobziar and Thompson III, 2020). Another recent study showed an association between elevated levels of COVID-19 cases and high PM2.5 concentrations originating from wildfires in the 4 weeks after exposure in counties with large wildfires in 2020 (Zhou et al 2021). A broader analysis of project air quality impacts is presented in Section 4.3, *Air Quality*.

In addition to fire code regulations, local general plans contain policies and programs aimed at reducing the risk of wildland fires through land use compatibility, training, sustainable development, brush management, and public outreach. To effectively mitigate wildland fire hazards in the San Diego region, a multilateral approach that involves federal, State, and local governments and fire agencies is necessary. Collectively, the local jurisdictions and fire agencies work together to prevent the loss of life in wildland fires, the ignition of structures by wildland fires, the encroachment of wildland fire into communities, and a wildfire-caused structural conflagration; as well as limit the size of wildland fires. Also, at the jurisdictional level, the continued monitoring and updating of existing development regulations and plans reinforce the value of defensible space to further reduce the impact of wildfires on people and structures. Finally, public education and firefighter training, support, and emergency operations efforts help reduce the risks of impacts involving wildfires.

The existing policies and regulations included in Section 4.19.2 as they relate to fire code regulations, fire agency plans, and local general plans, policies, and programs aimed at reducing the risk of wildland fires through land use compatibility, training, sustainable development, brush management, and public outreach, coupled with the strategies above, would help reduce the risks to people and structures associated with wildland fires. However, due to the relatively large area within the San Diego region that is considered at high risk for wildland fires, the regional growth and land use change associated with the proposed Plan would substantially expand the WUI and expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildland. These wildfires would in turn expose county residents to harmful pollution concentrations in the form of wildfire smoke. Impacts related to the exposure of additional people and structures to risk of loss, injury, or death involving wildland fires, and the impacts related to the exposure of people to pollutant concentrations in the form of wildfire smoke, would be significant.

Transportation Network Improvements and Programs

The transportation network improvements and programs that would be implemented between 2016 and 2025 generally would be focused in the highly urbanized western portion of the region (Figure 4.19-4), and portions of this area remain susceptible to wildland fires due to climate, topography, and native vegetation. Between 2016 and 2025, new transportation network improvements in the SRA would occupy a total of 34 acres. These improvements would consist primarily of arterial roadway upgrades and completion of the State Route (SR) 76 widening between Mission Avenue and Interstate 15 (I-15),. The transportation improvements within the SRA would occupy a total of 11 acres of land classified as VHFSZs. A total of 16 acres of land within the LRA would be occupied by new transportation improvements. All 11 acres are classified as VHFSZs and would consist of arterial roadways and light rail transit (LRT) lines. Development of the Central Mobility Hub and the San Ysidro Mobility Hub would commence, however the location and nature of these improvements would not exacerbate fire risk.

In general, transportation projects and facilities are not typically susceptible to substantial damage from wildfires and would not contribute added fuel to wildfires. Generally, the most noticeable effect of wildland fires on the transportation systems proposed would be temporary interruption of service with little expectation of damage to property or injury to people. In addition, improving the capacity of the existing transportation network would result in increased use of the existing corridors beyond the terminus of current conditions, indirectly enhancing potential evacuation routes and/or providing additional firebreaks.

Any transportation network improvements constructed in fire hazard severity zones or the WUI would be obligated to conform to the statutory and regulatory requirements of federal, State, and local regulations as discussed in Section 4.19.2 and wildfire-related mitigation measures required as a result of project-specific CEQA review. Nevertheless, fire hazards such as welding and heavy equipment operation exist during transportation facility construction. Implementation and operation of the transportation network improvements and programs would increase the exposure of additional people and structures to wildfires. Therefore, the transportation network improvements and programs associated with the proposed Plan would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildland. Impacts would be significant.

2025 Conclusion

Regional growth and land use change associated with the proposed Plan between 2016 and 2025 would expose additional people and structures to risk of loss, injury, or death involving wildland fires, and would expose of people to harmful pollutant concentrations in the form of wildfire smoke. The concentrations exacerbate health issues and are a contributing cause to premature deaths. Transportation network improvements and programs associated with the proposed Plan would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildland. Risks would be exacerbated in areas where designated Mobility Hubs, characterized by a higher density of jobs and residences, would develop within and adjacent to VHFSZs. These impacts would be significant.

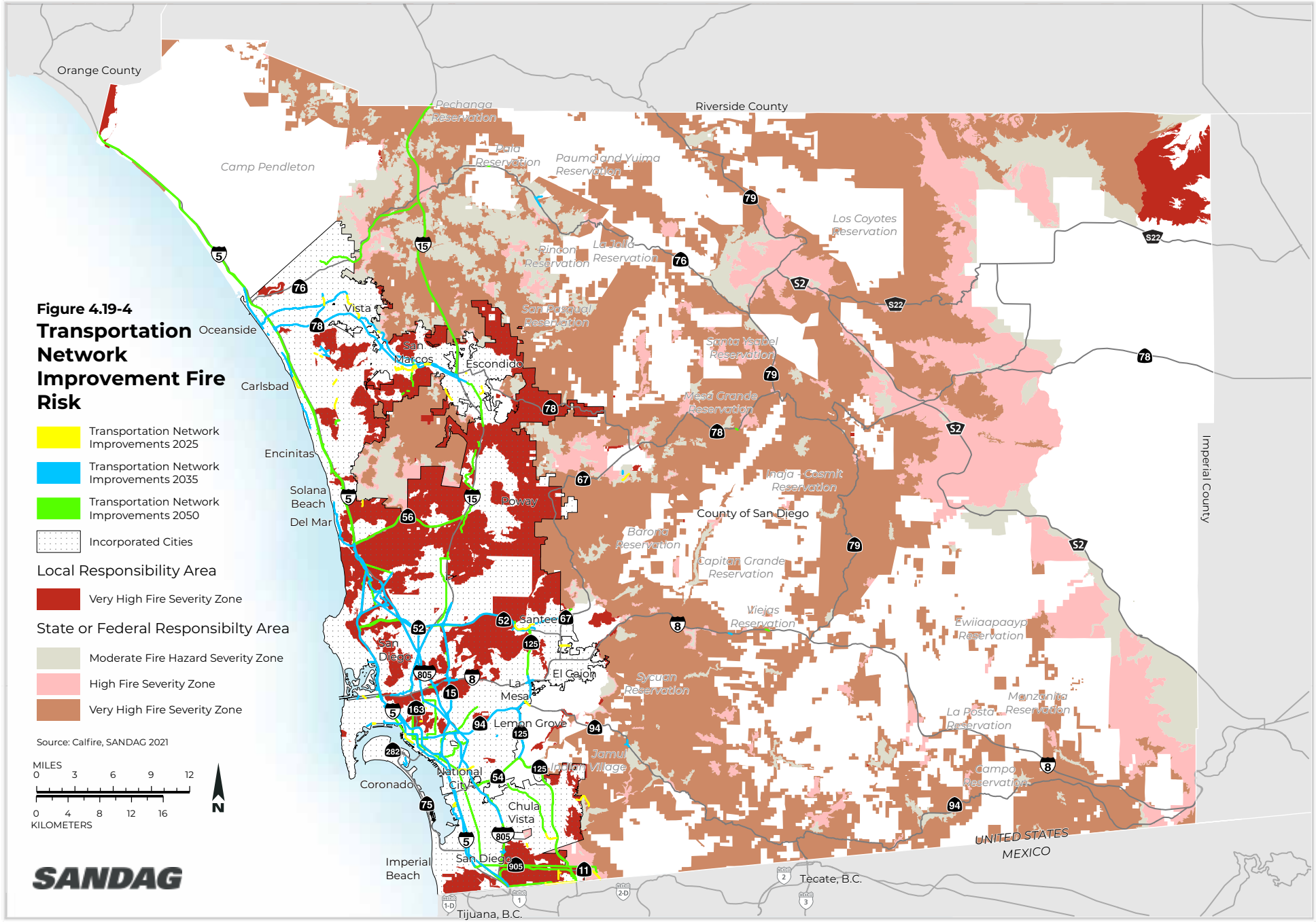


Figure 4.19-4
Transportation Network Improvement Fire Risk
Transportation Network Improvements 2025
Transportation Network Improvements 2035
Transportation Network Improvements 2050
Incorporated Cities
Local Responsibility Area
Very High Fire Severity Zone
State or Federal Responsibilty Area
Moderate Fire Hazard Severity Zone
High Fire Severity Zone
Very High Fire Severity Zone
Source: Calfire, SANDAG 2021
MILES 0 3 6 9 12
0 4 8 12 16 KILOMETERS
N
SANDAG
Orange County
Riverside County
Imperial County
County of San Diego
Camp Pendleton
Pechanga Reservation
Pala Reservation
Paumo and Yuima Reservation
Los Coyotes Reservation
Rincon Reservation
La Jolla Reservation
San Pasqual Reservation
Santa Ysabel Reservation
Mesa Grande Reservation
Inaja - Cosmit Reservation
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Ewiiaapaayp Reservation
Sycuan Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Jamul Indian Village
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Santee
El Cajon
La Mesa
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
San Diego
Tijuana, B.C.
Tecate, B.C.
UNITED STATES
MEXICO

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional growth is forecast to result in an increase of 149,500 people (4.3 percent), 121,650 housing units (9.4 percent), and 159,728 jobs (9 percent). Approximately 78 percent of the 2035 population growth would occur in the City of San Diego (70.9 percent) and City of National City (7.3 percent). These two jurisdictions would account for approximately 73 percent of new housing units and 60 percent of new jobs between 2026 and 2035. This development in urban areas would pose minimal wildland fire risk.

As discussed in the 2016–2025 analysis, increased regional growth and land use change between 2026 and 2035 would be located in WUIs and VHFSZs as shown on Figure 4.19-2. A total of 2,633 acres of land is forecast to be occupied by new development within the SRA between 2026 and 2035. A total of 1,193 acres of this new development is forecast to occur in VHFSZs. The areas of forecast development are at times not contiguous to existing developed areas and would represent an expansion of the WUI. An additional 544 acres of new development is forecast within the LRA. All 544 acres are projected to be within VHFSZs. Growth experienced between 2026 and 2035 may result in an increased demand for fire protection services and increased demand on the existing water supply. In the event of a major wildland fire, the lack of available fire response staff or adequate response times, or infrastructure constraints such as insufficient water supply, may also contribute to an increased risk of wildland fire hazard. The existing policies and regulations included in Section 4.19.2 as they relate to fire code regulations, fire agency planning, and local general plans, policies, and programs aimed at reducing the risk of wildland fires through land use compatibility, training, sustainable development, brush management, and public outreach, coupled with the strategies listed in table 4-19.2, would help reduce the risks to people and structures associated with wildland fires.

Due to the relatively large area within the San Diego region that is considered at very high risk for wildland fires, the regional growth and land use change associated with the proposed Plan would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildland. Wildfires would also potentially expose the region's population to harmful pollutant concentrations in the form of wildfire smoke. Therefore, impacts related to the exposure of additional people and structures to risk of loss, injury, or death involving wildland fires, and exposure of people to pollutant concentrations, would be significant. Therefore, this impact in the year 2025 would be significant.

Transportation Network Improvements and Programs

Between 2026 and 2035, additional transportation network improvements and programs would occur in the San Diego region as part of the proposed Plan. As discussed in the 2025 analysis, the majority of the transportation network improvements included in the proposed Plan are focused in the highly urbanized western portion of the region. A total of 15 acres of land within the SRA would be occupied by new transportation improvements between 2026 and 2035. Only 4 acres of land classified as VHFSZs would be developed as transportation improvements within the SRA. A total of 509 acres of land would be developed as transportation improvements within the LRA between 2026 and 2035. All 509 acres would occur within VHFSZs. These improvements consist primarily of Complete Corridor improvements along I-5, I-15, I-8, I-805, SR 52, SR 78, SR 94, and SR 125. Additional improvements include arterial roadways in eastern Chula Vista.

Any transportation network improvements constructed in VHFSZs or WUIs would be obligated to conform to the statutory and regulatory requirements of federal, State, and local regulations as discussed in Section 4.19.2.

Implementation of the transportation network improvements and programs would increase the exposure of additional people and structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildland. Impacts would be significant.

2035 Conclusion

Regional growth, land use change, and transportation network improvements associated with the proposed Plan forecast between 2026 and 2035 would expose additional people and structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildland. Risks would be exacerbated in areas where designated Mobility Hubs, characterized by a higher density of jobs and residences, would develop within and adjacent to VHFSZs. Wildfires would also potentially expose the region's population to harmful pollutant concentrations in the form of wildfire smoke. The concentrations exacerbate other health issues and are a contributing cause to premature deaths. Therefore, impacts in the time period between 2026 and 2035 related to the exposure of additional people and structures to risk of loss, injury, or death involving wildland fires, and the impacts related to the exposure of people to pollutant concentrations in the form of wildfire smoke, would be significant.

2050

Regional Growth and Land Use Change

Between 2036 and 2050, regional growth in proximity to WUIs and VHFSZs, as shown on Figure 4.19-3, would contribute to the risk of loss, injury, or death involving wildland fires. Additional regional growth and land use change forecast between 2036 and 2050 would occur in areas at high risk for wildland fires and expose additional people and structures to a significant risk of loss, injury, or death involving wildland fires. No development is forecast in the SRA between 2036 and 2050. In the LRA, 172 acres of development is forecast. All 172 acres are projected to occur within VHFSZs.

The existing policies and regulations included in Section 4.19.2 as they relate to fire code regulations, fire agency plans, and local general plans, policies, and programs aimed at reducing the risk of wildland fires through land use compatibility, training, sustainable development, brush management, and public outreach, coupled with the strategies listed in Table 4-19.2 would help reduce the risks to people and structures associated with wildland fires. However due to the relatively large area within the San Diego region that is considered at high risk for wildland fires, the regional growth and land use change associated with the proposed Plan would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildland. Wildfires would also potentially expose the region's population to harmful pollutant concentrations in the form of wildfire smoke. Therefore, impacts related to the exposure of additional people and structures to risk of loss, injury, or death involving wildland fires, and the impacts related to the exposure of people to pollutant concentrations in the form of wildfire smoke, would be significant.

Transportation Network Improvements and Programs

Transportation network improvements and programs in place between 2036 and 2050 would be located in areas that are susceptible to wildland fires. A total of 483 acres of land is forecast to be developed within the SRA as transportation network improvements between 2036 and 2050. Of this total 441 acres would be on land classified as VHFSZs. These improvements consist largely of Complete Corridor improvements along I-15

between Escondido and the Riverside County line. Within the LRA, 620 acres of land would be developed with transportation network improvements. All 620 acres would be land within VHFSZs. These improvements include Complete Corridor improvements along I-5, I-8, SR 52, SR 54, SR 56, SR 125, and SR 905. Any transportation network improvements constructed in VHFSZs or WUIs would be obligated to conform to the statutory and regulatory requirements of federal, State, and local jurisdictions, as discussed in Section 4.9, *Hazards and Hazardous Materials*. Implementation of the transportation network improvements and programs, however, would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildland.

2050 Conclusion

Regional growth, land use change, and transportation network improvements associated with the proposed Plan forecast between 2036 and 2050 would expose additional people and structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildland. Risks would be exacerbated in areas where designated Mobility Hubs, characterized by a higher density of jobs and residences, would develop within and adjacent to VHFSZs. Wildfires would also potentially expose the region's population to harmful pollutant concentrations in the form of wildfire smoke. The concentrations exacerbate other health issues and are a contributing cause to premature deaths. Therefore, impacts in the time period between 2036 and 2050 related to the exposure of additional people and structures to risk of loss, injury, or death involving wildland fires, and the impacts related to the exposure of people to pollutant concentrations in the form of wildfire smoke, would be significant.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan would exacerbate climate change effects of exposing additional people and structures to significant risk of loss, injury, or death involving wildland fires. Climate change is expected to result in a longer and less predictable fire season and drive factors that may worsen wildfires, such as more frequent and intense dry Santa Ana winds, drier autumns, and increased development and presence of dead fuels (Kalansky et al. 2018). The proposed Plan would increase development and transportation network improvements in WUIs, heightening the risk of ignitions from human sources that would threaten existing development, as well as exposing more people and structures to wildfires.

MITIGATION MEASURES

WF-1 DUE TO SLOPE, PREVAILING WINDS, AND OTHER FACTORS, EXACERBATE WILDFIRE RISKS, AND THEREBY EXPOSE PROJECT OCCUPANTS TO POLLUTANT CONCENTRATIONS FROM A WILDFIRE OR THE UNCONTROLLED SPREAD OF A WILDFIRE; OR EXPOSE PEOPLE OR STRUCTURES, EITHER DIRECTLY OR INDIRECTLY, TO A SIGNIFICANT RISK OF LOSS, INJURY OR DEATH INVOLVING WILDLAND FIRES

2025, 2035, and 2050

WF-1 Reduce Wildfire Risk for Development and Transportation Projects. During planning, design, and project-level CEQA review of transportation network improvements or development projects located in SRAs or in LRAs classified as VHFHSZs, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions such as fire protection agencies can and should, ensure that project

sponsors implement measures to reduce impacts from wildfires. Such measures include, but are not limited to, the following:

- Establishing site-specific safety measures, such as fire protection plans, to protect local resources from wildfire. Fire protection plans should be based on appropriate wildfire modeling, and include information related to reducing ignition risks during construction and operation of facilities.
- Adhering to the most updated building code requirements (usually updated every 3 years), including ignition-resistant construction and inclusion of design features that prevent the intrusion of flames and embers.
- Improving access by designing and improving roads, transit facilities, gates, and access plans to accommodate emergency response and evacuation if necessary.
- Ensuring sufficient emergency water supply for existing and new projects by working with water management agencies and plans.
- Enforcing defensible space regulations to keep overgrown and unmanaged vegetation and other flammable material away from structures.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Mitigation measure WF-1 will reduce this impact (WF-1) by requiring measures to preclude or substantially reduce risks from wildland fires in VHFSZs by requiring specific design features for new development and by requiring that adequate emergency response is in place to serve new development when wildfires occur. To the extent that these measures reduce risk of wildfire, they would also reduce the exposure of county residents to uncontrolled wildfire spread and to harmful pollutant concentrations in the form of wildfire smoke. However, these mitigation measures do not reduce this impact (WF-1) to a less-than-significant level in all locations for all future wildfires, and therefore resulting exposure to uncontrolled wildfires and the pollution in the form of particulate matter from wildfire smoke. This exposure would occur throughout the time period 2016-2050 given the relatively large area within the San Diego region considered at high risk for wildland fires and the level of uncertainty regarding the location, frequency, and severity of future wildfires. When wildfires occur, prevailing weather conditions usually are such that major portions of the regional population are exposed to dangerous pollution concentrations from wildfire smoke. For these reasons, it cannot be concluded that wildland fire risks and the risks associated with wildfire smoke pollution would be reduced to less than significant in all locations for all future development projects. Because there are no feasible mitigation measures to reduce this impact to less than significant, this impact remains significant and unavoidable.

WF-2 REQUIRE THE INSTALLATION OR MAINTENANCE OF ASSOCIATED INFRASTRUCTURE (SUCH AS ROADS, FUEL BREAKS, EMERGENCY WATER SOURCES, POWER LINES OR OTHER UTILITIES) THAT MAY EXACERBATE FIRE RISK OR THAT MAY RESULT IN TEMPORARY OR ONGOING IMPACTS TO THE ENVIRONMENT

ANALYSIS METHODOLOGY

This section incorporates the analysis methodology used for WF-1 to evaluate wildfire risks, but focuses on components of projects that comprise public infrastructure and services, such as water sources, lines, and access roads, required to support regional growth and transportation network projects. The potential to exacerbate fire risk or result in temporary impacts on the environment is qualitatively analyzed based on the

expected need for infrastructure, primarily in areas where new development would include expansion of these services. The need for expanded public services and utility infrastructure identified in PS-1 and U-1 in Section 4.15 has been included in the analysis.

2025

Regional Growth and Land Use Change

From 2016 to 2025, regional growth is forecast to result in an increase of 161,338 people (4.8 percent), 97,661 housing units (5.9 percent), and 115,328 jobs (7 percent). Approximately 78.8 percent of the 2025 population growth would occur within the cities of San Diego (57.9 percent), Chula Vista (12.1 percent), and Escondido (8.8 percent). Collectively, these three jurisdictions would accommodate approximately 78 percent of new housing units and 63 percent of new jobs between 2016 and 2025. In these cities, higher demand for new utility infrastructure, upgraded systems, and/or expansions would occur, while demand for utilities would also increase throughout the region in response to forecast growth.

In general, regional growth and land use change in urban areas, largely within the LRA when considering wildfire risk, would have less demands on utilities than in more rural areas that are less comprehensively served by existing utility infrastructure. The San Diego County Water Authority (SDCWA) has indicated that it has sufficient supply, storage capacity, and delivery capability to satisfy water demands through 2035 (SDCWA 2014). The SDCWA has completed a number of major capital projects in recent years, such as the additional storage capacity at San Vicente Reservoir, and no further projects of this magnitude are currently scheduled. No water services dedicated specifically to emergencies, including wildfires, are contemplated. During the major wildfire events of 2003 and 2007 the SDCWA was able to provide adequate water supplies for fire suppression (SDCWA 2021).

Connections for new water service within the LRA, and often within the SRA, would typically be accomplished via trenching within public rights-of-way (ROW) and would create minimal risk of wildfire. Fire risks associated with construction activities are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and best management practices (BMPs) for fire prevention.

Regional population growth would result in an increase in the amount of wastewater generated, especially in the cities of San Marcos, National City, and Chula Vista. As discussed in Section 4.15, existing wastewater treatment plants serving the region's cities have sufficient capacity to serve forecast growth through 2025. Smaller treatment plants throughout the region may reach capacity and need to be expanded. Development in existing communities would require expansion or upsizing of existing collection and treatment systems, while development in new areas would require installation of new collection and treatment systems. Development in rural residential areas would also require onsite wastewater treatment facilities, such as septic tanks. The pipelines associated with these new and expanded facilities would be installed underground, typically in the public ROW. Fire risks associated with construction activities would be controllable or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs for fire prevention.

As discussed in Section 4.6, *Energy,* the region's energy demands will increase along with the region's population. The impacts of construction and operation of energy-generating facilities would have a range of impacts depending on the facility type, size, and location. The provision of new or expansion of existing energy-generation facilities would result in construction-related impacts. Additional demand for natural gas may also

require the construction of new supply, conveyance, storage, and distribution infrastructure. Fire risks originating from construction activities would be controlled or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing fire prevention regulations and BMPs.

Additional transmission lines would be needed to meet growing demand for electricity resulting from regional population, housing, and employment growth. Additional facilities would also be needed depending on the location and timing of regional growth and the location of new generation facilities. Forecast regional growth and land use change would primarily occur in or adjacent to areas that are already developed and that have electricity and natural gas infrastructure in place. This would be particularly the case in the LRA, and to a lesser extent in the SRA in areas where new development is contiguous to existing development. Although this would reduce the need for construction of new facilities in other areas, the increases in demand for electricity, and development in non-contiguous or topographically constrained areas within the SRA, would potentially create a need for new transmission lines routed across undeveloped land.

The construction of new transmission lines across natural habitat within VHFSZs or vegetated land within the WUI results in a severe fire danger. Wildfires are caused along transmission lines as a result of various types of equipment malfunctions. Most common are downed lines or arcing between conductors that generates heat and sparks to ignite vegetation (New York Energy Week 2018). Many hundreds of thousands of acres in California alone have been burned as a result of wildfires caused by power line failures in recent years. In the summer of 2018 alone, 17 large wildfires were caused in the state as a result of downed power lines (Atkinson 2018). These fires have resulted in many millions of dollars in fines being levied against electrical utilities, including a $14.4 million fine paid by SDG&E as a result of the 2007 Witch, Rice, and Guejito fires in San Diego County (New York Energy Week 2018). SDG&E has made substantial progress in undergrounding transmission lines (Atkinson 2018). However, absent a commitment to underground all future lines serving new development in VHFSZs, new electrical transmission infrastructure poses a significant fire risk.

Current fire planning in San Diego County does not call for additional fire roads or fuel breaks (County of San Diego Fire Authority 2019); therefore, no impacts from the creation of fire breaks or fire roads are anticipated.

Transportation Network Improvements and Programs

Utilities serving regional transportation network improvements developed between 2016 and 2025 would consist primarily of electrical lines for signage, signals, and LRT propulsion along with reclaimed water lines for landscape irrigation. These utility lines would be constructed within the transportation facility ROW. The electrical transmission would occur primarily via underground conduit. Water lines for irrigation would be installed underground. These lines would pose minimal fire risk. In those instances where aboveground electrical facilities are required, such as substations or catenary for the Mid-Coast LRT line, the facilities would be located in urban areas with buffers from any vegetation. Fire risk impacts related to the installation of these utilities would be less than significant.

2025 Conclusion

Land development between 2016 and 2025 would expand into VHFSZs within the LRA, and the SRA. This development would require extension and expansion of existing utilities. In instances where utilities are expanding contiguous to existing development, or when utilities are installed underground, as is typically the case in urban areas or in association with transportation network improvements, there is minimal fire risk as construction activities would be controlled by mitigation measures adopted by the implementing agency, including adherence to existing fire prevention regulations and BMPs. In instances where new land

development would require construction or extension of aboveground electrical transmission lines, a substantial risk of sparking a wildfire exists, which would be a significant impact.

2035

Regional Growth and Land Use Change

From 2026 to 2035, regional growth is forecast to result in an increase of 149,500 people (4.3 percent), 121,650 housing units (9.4 percent), and 159,728 jobs (9 percent). Approximately 78 percent of the 2035 population growth would occur in the City of San Diego (70.9 percent) and City of National City (7.3 percent). These two jurisdictions would account for approximately 73 percent of new housing units and 60 percent of new jobs between 2026 and 2035. In these cities, higher levels of public services would be needed, although demand for public services would increase throughout the region in response to forecast growth. Growth and development within existing urban areas would have less demands on utilities than in more rural areas that are less served by existing utility infrastructure. This development in urban areas would pose minimal fire risk.

The SDCWA has indicated that it has sufficient supply, storage capacity, and delivery capability to satisfy water demands through 2035 (SDCWA 2016). No major capital projects related to additional water storage or conveyance capacity are scheduled during this period. No water services dedicated specifically to emergencies, including wildfires, are contemplated. During the major wildfire events of 2003 and 2007 the SDCWA was able to provide adequate water supplies for fire suppression.

Connections for new water service within the LRA, and often within the SRA, would typically be accomplished via trenching within public ROW and would create minimal risk of wildfire. Fire risks associated with construction activities are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs for fire prevention.

Regional population growth would result in an increase in the amount of wastewater generated. As discussed in Section 4.15, some expansion of the region's wastewater treatment capacity would likely be required to serve forecast growth through 2035. Smaller treatment plants throughout the region may reach capacity and need to be expanded. Development in existing communities would require expansion or upsizing of existing collection and treatment systems, while development in new areas would require installation of new collection and treatment systems. Development in rural residential areas would also require onsite wastewater treatment facilities, such as septic tanks. The pipelines associated with these new and expanded facilities would be installed underground, typically in the public ROW. Fire risks associated with construction activities would be controllable or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs for fire prevention.

As discussed in Section 4.6, the region's energy demands will increase along with the region's population. The impacts of construction and operation of energy-generation facilities would have a range of impacts depending on the facility type, size, and location. The provision of new or expansion of existing energy-generation facilities would result in construction-related impacts. Additional demand for natural gas may also require the construction of new supply, conveyance, storage, and distribution infrastructure. Fire risks originating from construction activities would be controlled or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing fire prevention regulations and BMPs.

Additional transmission lines would be needed to meet growing demand for electricity resulting from regional population, housing, and employment growth. Additional facilities would also be needed depending on the

location and timing of regional growth and the location of new generation facilities. Forecast regional growth and land use change would primarily occur in or adjacent to areas that are already developed and that have electricity and natural gas infrastructure in place. This would be particularly in the case in the LRA, and to a lesser extent in the SRA in areas where new development is contiguous to existing development. Although this would reduce the need for construction of new facilities in other areas, the increases in demand for electricity, and development in non-contiguous or topographically constrained areas within the SRA, would potentially create a need for new transmission lines routed across undeveloped land. As discussed above, absent a commitment to underground all future lines serving new development in VHFSZs, new electrical transmission infrastructure is a significant fire risk.

Current fire planning in San Diego County does not call for additional fire roads or fuel breaks (County of San Diego Fire Authority 2019); therefore, no impacts from the creation of fire breaks or fire roads are anticipated.

Transportation Network Improvements and Programs

Utilities serving regional transportation network improvements developed between 2026 and 2035 would primarily involve electrical lines for signage, signals, and LRT propulsion, as well as reclaimed water lines for landscape irrigation. These utility lines would be constructed within the transportation facility ROW. The electrical transmission would occur primarily via underground conduit. Water lines for irrigation would be installed underground. These lines would pose minimal fire risk. In those instances where aboveground electrical facilities are required, such as substations or catenary for the installation of a third track on existing LRT segments, the facilities will be located in urban areas with buffers from any vegetation. Fire risk impacts related to the installation of these utilities would be less than significant.

2035 Conclusion

Land development between 2026 and 2035 would expand into VHFSZs in the LRA, and the SRA. This development would require extension and expansion of existing utilities. In instances where utilities are expanding contiguous to existing development, or when utilities are installed underground as is the typically the case in urban areas or in association with transportation network improvements, there is minimal fire risk as construction activities would be controlled by mitigation measures adopted by the implementing agency, including adherence to existing fire prevention regulations and BMPs. In instances where new land development would require construction or extension of aboveground electrical transmission lines, a substantial risk of sparking a wildfire exists, which would be a significant impact.

2050

Regional Growth and Land Use Change

From 2036 to 2050, regional growth is forecast to result in an increase of 125,725 people (3.4 percent), 61,433 housing units (4.3 percent), and 164,843 jobs (8.5 percent). Approximately 78 percent of the 2050 population growth would occur in the City of San Diego, City of Chula Vista, and City of San Marcos. In these cities, higher demand for new utility infrastructure, upgraded systems, and/or expansions would occur, while demand for utilities would also increase throughout the region in response to forecast growth. Regional growth and land use change in urban areas would have less demands on utilities than in more rural areas that are not currently served by utility infrastructure.

The horizon for current planning regarding the region's water supply, storage, and conveyance regime is 2036 (SDCWA 2013). The need for investment in major water infrastructure beyond 2035 is therefore unknown.

Increasing population combined with climate change add to this uncertainty. In the event that large-scale water projects are undertaken, fire risks associated with construction activities would be controllable or substantially lessened by mitigation measures adopted by the SDCWA, including adherence to existing regulations and BMPs for fire prevention. No land development in the SRA is forecast for the years between 2036 and 2050, and construction is anticipated to occur in cities and other existing built-up areas. Connections to this new development would be via underground pipes and would pose minimal fire risk.

As discussed in Section 4.15, some expansion of the region's wastewater treatment capacity would likely be required to serve forecast growth through 2050. Smaller treatment plants throughout the region may reach capacity and need to be expanded. Minimal development in rural areas is forecast, but development in existing communities would require expansion or upsizing of existing collection and treatment systems. The pipelines associated with these new and expanded facilities would be installed underground, typically in the public ROW. Fire risks associated with construction activities would be controllable or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs for fire prevention.

As discussed in Section 4.6, the region's energy demands will increase along with the region's population. The impacts of construction and operation of the facilities would have a range of impacts depending on the facility type, size, and location. The provision of new or expansion of existing energy-generation facilities would result in construction-related impacts. Additional demand for natural gas may also require the construction of new supply, conveyance, storage, and distribution infrastructure. Fire risks originating from construction activities would be controlled or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing fire prevention regulations and BMPs.

Land development between 2036 and 2050 would occur primarily in cities and in areas contiguous to existing development. While increased demand would likely require expansion of utility systems, and Construction would occur primarily in or contiguous to existing developed areas. In instances where utilities are expanding contiguous to existing development, or when utilities are installed underground, as is the typically the case in urban areas or in association with transportation network improvements, there is minimal fire risk as construction activities would be controlled by mitigation measures adopted by the implementing agency, including adherence to existing fire prevention regulations and BMPs. There would, however, be additional above-ground electrical distribution infrastructure required to serve new development within the LRA. There are extensive VHFSZs within the LRA, and this new electrical distribution infrastructure may affect these areas, as well as some areas within the SRA. Impacts related to fire risks resulting from infrastructure expansion to serve regional development occurring between 2036 and 2050 are found to be significant.

Transportation Network Improvements and Programs

Utilities serving regional transportation network improvements developed between 2036 and 2050 would primarily involve electrical lines for signage, signals, and LRT propulsion, as well as reclaimed water lines for landscape irrigation. These utility lines would be constructed within the transportation facility ROW. The electrical transmission would occur primarily via underground conduit. Water lines for irrigation would be installed underground. These lines would pose minimal fire risk. In those instances where aboveground electrical facilities are required, such as substations or catenary for the installation of a third track on existing LRT segments, the facilities will be located in urban areas with buffers from any vegetation. Fire risk impacts related to the installation of these utilities would be less than significant.

2050 Conclusion

Land development between 2036 and 2050 would expand into VHFSZs in the LRA, and the SRA. This development would require extension and expansion of existing utilities. In instances where utilities are expanding contiguous to existing development, or when utilities are installed underground as is the typically the case in urban areas or in association with transportation network improvements, there is minimal fire risk as construction activities would be controlled by mitigation measures adopted by the implementing agency, including adherence to existing fire prevention regulations and BMPs. In instances where new land development would require construction or extension of aboveground electrical transmission lines, a substantial risk of sparking a wildfire exists, which would be a significant impact.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan could exacerbate climate change effects on increased fire risk due to installation of new infrastructure. Installation of above-ground electrical distribution infrastructure in rural areas and high fire-risk areas could increase the risk of ignition, such as from downed wires or sparks from faulty infrastructure (Mitchell 2013). Combined with climate change effects that would increase wildfire risk, this could potentially result in more wildfires in the future.

MITIGATION MEASURES

WF-2 REQUIRE THE INSTALLATION OR MAINTENANCE OF ASSOCIATED INFRASTRUCTURE (SUCH AS ROADS, FUEL BREAKS, EMERGENCY WATER SOURCES, POWER LINES OR OTHER UTILITIES) THAT MAY EXACERBATE FIRE RISK OR THAT MAY RESULT IN TEMPORARY OR ONGOING IMPACTS TO THE ENVIRONMENT

2025, 2035, and 2050

WF-2 Reduce Wildfire Risk Related to Wildfire-Associated Infrastructure Required to Support Development or Transportation Projects. During planning, design, and project-level CEQA review of transportation network improvements or development projects located in SRAs or in LRAs classified as VHFHSZs, the County of San Diego, cities, other local jurisdictions, and public service and utility providers can and should ensure that project sponsors implement measures to reduce impacts from wildfire-associated infrastructure. Such measures include, but are not limited to, the following:

- Establishing site-specific safety measures, such as fire protection plans, for new infrastructure and facilities required to provide public services and utilities for new development in order to protect local resources from wildfire.
- Adhering to wildfire safety and mitigation plans established by local utilities companies, including design and construction standards, inspection schedules, and emergency preparedness.
- Adhering to the most updated building code requirements (usually updated every 3 years) for structures related to public services and infrastructure, including ignition-resistant construction and inclusion of design features that prevent the intrusion of flames and embers.
- Ensuring sufficient emergency water supply (local water providers) for existing and new projects.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Mitigation measure WF-2, combined with other mitigation measures resulting from project-level CEQA conducted by the implementing agency, including adherence to existing fire prevention regulations and BMPs, would be sufficient to reduce impacts related to utility infrastructure construction to a level less than significant. However, land development within VHFSZs within the LRA and some areas in the SRA would likely require the construction of aboveground electrical transmission lines. Mitigation measure WF-2 would not reduce the serious fire risks posed by these transmission lines and the fire risk impacts would not be reduced to less-than-significant levels; therefore, this impact remains significant and unavoidable.

WF-3 EXPOSE PEOPLE OR STRUCTURES TO SIGNIFICANT RISKS, INCLUDING DOWNSLOPE OR DOWNSTREAM FLOODING OR LANDSLIDES, AS A RESULT OF RUNOFF, POST-FIRE SLOPE INSTABILITY, OR DRAINAGE CHANGES

ANALYSIS METHODOLOGY

A significant impact would occur if regional growth and land use change or transportation network improvements and programs were located in or near SRAs or LRA lands classified as VHFHSZs and would expose people or structures to significant risks related to post-fire changes in vegetation and topography. Risks related to downslope or downstream flooding, landslides, or drainage changes are discussed for areas where growth and transportation network improvements would be located in SRAs or LRAs classified as VHFHSZs, which tend to coincide with areas on steeper slopes, which are susceptible to these post-fire risks.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

Rainfall runoff is enhanced subsequent to wildfire due to changes in soil properties, loss of vegetation cover, and destruction of organic debris on the ground surface. Runoff is accelerated down burned hillslopes compared to unburned hillslopes for two reasons. Surficial soil characteristics are altered when subjected to high temperatures and become water repellant (USGS 2021a). Vegetation, which would normally provide resistance to runoff flow and dissipate its energy, is absent. During intense rainfall, post-fire conditions can cause flooding to occur much faster than under normal conditions (hence, “flash” flooding). In the years immediately following a wildfire, accelerated runoff can cause flooding, debris flows, and landslides.

In the immediate aftermath of wildfires there is a heightened risk of flash floods due to higher than normal runoff rates. This increases flood waters above what would normally occur with a given rate of precipitation. The more intense rain events predicted as a result of climate change increase the risk of these post-wildfire flash floods. Areas already in or close to flood zones would be at greater risk.

Debris flows are common events in Southern California in the aftermath of wildfires. Debris flows are sediment-laden slurries resulting from surface runoff accumulating on hillslopes and channel material such as soil, logs, and boulders as it moves downslope. San Diego County and Southern California in general, has a history of damaging post-fire debris flows due to the combination of high wildfire frequency, steep terrain covered by high fuel loads, periodic high-intensity rain storms and high population densities. Over the last century, major

debris flow events causing widespread damage (destruction of 40 or more structures) and loss of life have occurred on average every 13 years (Kean and Staley 2021). Events causing more localized but still substantial damage occur with more frequency. This has led to the construction of sediment and debris retention basins at the most exposed locations, such as along the southern base of the San Gabriel Mountains.

Study of debris flow events has shown that they are often triggered by high-intensity rainfall events of relatively short duration, and that unlike more typical landslides, they are not dependent on underlying soil saturation (Kean and Staley 2021). The greatest likelihood of a debris flow occurs in the rainy season immediately following the wildfire. A U.S. Geological Survey study covering the larger southwestern study area found that debris flows were triggered by a median 2-year storm event, meaning a storm event that was likely on average to happen every other year (USGS 2021a). It has been predicted that, in the event of a severe wildfire followed by an average or greater storm event, there is a 5 to 12 percent probability of an ensuing debris flow.

The USGS has developed an analytical methodology for assessing the risk of damaging floods and resulting debris flows (USGS 2021a). This methodology uses watershed terrain and configuration, wildfire burn severity, soil properties, and rainfall characteristics to estimate the probability and volume of debris flows that may occur in response to a 2-year storm. Many such assessments have been conducted in the aftermath of wildfires across the western United States. A problem arises in that these assessments are performed after a wildfire has occurred. In late fire-season wildfires there is often a very short interval between the fire and the onset of winter rains, and the first rain season after the wildfire is the period of highest risk (Kean and Staley 2021; Rengers et al. 2020). This short window combined with the widespread fires occurring in the American West means that most burn areas are not assessed.

Kean and Staley (2021) applied the USGS assessment methodology regionally across all of Southern California. It was found that the areas of most severe risk were at the base of the transverse ranges (i.e., the San Bernardino and San Gabriel Mountains). Virtually all other slopes in Southern California, however, were rated as a moderate to high risk for debris flows, assuming a median intensity wildfire and typical high-intensity rainstorm. They conclude that, with the increasing warming, extended fire season, and higher intensity rainstorms expected as a result of the changing climate, the frequency of debris flows will increase. Virtually all slopes within the VHFHSZs in San Diego County are classified at a moderate to high risk of debris flows (Kean and Staley 2021; Figures 3–5).

Landslides also occur subsequent to wildfires. Unlike debris flows, which most often occur in the rainy season immediately after a wildfire, a study of rainfall-induced landslides in burn areas across Southern California, including several in San Diego County, shows that they are more likely to occur 3 years after the wildfire (Rengers et al. 2020). Rainfall-induced landslides increase in frequency after some vegetation recovery has occurred and the water repellant soil properties present immediately after wildfires have subsided. The above study also monitored a 70-square-kilometer area in the San Gabriel Mountains containing several wildfire burn areas of varying age. This focused area of study confirmed that rainfall-induced landslides are most likely during peak rainfall intensity periods in the midst of protracted storms in the third-year wet season following the wildfire. Landslides are far more likely to occur on south, southwest, and southeast-facing slopes. This is thought to be a result of the sparser vegetation cover present on these slopes compared to north-facing slopes receiving less direct sunlight.

Mapping of known or suspected landslides within San Diego County illustrates that they have occurred across large portions of the County, including within areas covered by the VHFSZ designation (USGS 2021b). Mapped landslides are widespread, but mapped known or suspected landslides covered by the VHFSZ designation are concentrated in the Otay Ranch area of Chula Vista, El Cajon, Santee, and Poway.

Forecast regional growth and land use change between 2016 and 2025 would result in the development of 6,070 acres of land within the SRA. Of this total, 3,433 acres are forecast on land classified as VHFSZs. A total of 3,222 acres of new development is forecast between 2016 and 2025 within the LRA. All of this acreage would be on land classified as VHFSZs. Substantial portions of this land are on or below slopes that could generate floodwaters, debris flows, or landslides. Increasing levels of severe wildfire occurrence are expected in these VHFSZs as a result of the changing climate. At the same time some individual rain events are expected to be more severe. Development and people within these areas would face an elevated level of flood risk due to accelerated runoff from burn areas. There would be a high likelihood of damaging debris flows from burned slopes, particularly from slopes that burned during the immediately prior fire season. In the subsequent rainy seasons, a higher likelihood of landslides would be expected in burned areas that are characterized by landslide risk. The exposure of people and structures to increased risk of flooding, debris flows, and landslides, as a result of post-fire runoff is a significant impact.

Transportation Network Improvements and Programs

The transportation network improvements and programs that would be implemented between 2016 and 2025 generally would be focused in the highly urbanized western portion of the region, although portions of this area remain susceptible to wildland fires due to climate, topography, and native vegetation as previously discussed. Between 2016 and 2025, new transportation network improvements would occupy a total of 34 acres of land within the SRA, consisting primarily of arterial roadway upgrades and completion of the SR 76 widening between Mission Avenue and I-15. A total of 11 of these 34 acres would be on land classified as VHFSZs. Within the LRA 16 acres of land would be developed with transportation improvements. All 16 acres are classified as VHFSZs, consisting primarily of planned arterial roadways and improvements along LRT lines.

In general, transportation projects and facilities are designed and implemented in a manner that would result in no changes in vegetation and topography that, after a wildfire, would increase risks related to downslope or downstream flooding, landslides, or drainage changes. By conducting hydraulic studies before transportation facility design, and adhering to requirements for stormwater detention and floodplain regulation, transportation facilities projects typically do not substantially alter pre-project drainage conditions. Planned transportation network improvements themselves are structures that would be exposed to downslope risk from post-fire debris flows and landslides, however, and this exposure is a significant impact.

2025 Conclusion

Some regional growth and land use changes, and transportation projects, between 2016 and 2025 would occur in SRAs and VHFSZs within LRAs that have an elevated risk of post-wildfire flash floods, debris flows, and landslides. These events would potentially expose people, residences and other buildings, and transportation improvements, to elevated risk. These risks are a significant impact.

2035

Regional Growth and Land Use Change

Regional forecasts for the time period between 2026 and 2035 would include development an additional 2,633 acres of land within the SRA. Of this total, 1,193 acres would be classified as VHFSZ. A total of 544 acres of land is forecast to be developed within the LRA, all of which is classified as VHFSZ. This development would be scattered across the region. Within the LRA substantial development on lands classified as VHFSZ would be located along the SR 56 corridor and in northwestern Santee. This additional development in lands at high risk

for wildfire, and the corresponding expansion of the WUI, would expose additional people and buildings to elevated risk of flash floods, debris flows, and landslides after wildfires. These exposures are a significant impact.

Transportation Network Improvements and Programs

Transportation network improvements forecast for the period between 2026 and 2035 are forecast to occupy 15 acres in the SRA. Four of these acres would be on land classified as VHFSZs. A total of 509 acres is forecast to be occupied by new transportation improvements within the LRA, all of which would occur on land classified as VHFSZs. The transportation network improvements forecast within this time period in areas classified as VHFSZ would include Complete Corridor improvements to I-5, I-15, SR 67, SR 76, and SR 78. These transportations network improvements would be placed in downslope locations subject to an elevated level of risk from flash floods, debris flows, and landslides in the years following wildfires. This potential exposure is a significant impact.

2035 Conclusion

Some regional growth and land use changes, and transportation projects, between 2026 and 2035 would occur in VHFSZs within the SRA and within the LRA. Residents, buildings, and the structures including transportation facilities within these areas would be subject to an elevated level of risk of flash floods, debris flows, or landslides in the years following wildfires. These risks are a significant impact.

2050

Regional Growth and Land Use Change

No land development is forecast to occur within the SRA between 2036 and 2050. A total of 172 acres of land within the LRA is forecast to be developed. All 172 acres are classified as VHFSZs. This land is located in eastern Chula Vista and western Santee. The people and buildings within these developments would be subject to an elevated level of risk from flash floods, debris flows, and landslides in the years following wildfires. This exposure would be a significant impact.

Transportation Network Improvements and Programs

Transportation network improvements would be implemented on land classified as VHFSZ between 2036 and 2050. Within the LRA, a total of 620 acres would be developed as transportation improvements, all of which would be classified as VHFSZs. Notable planned facilities are improvements to freeway segments and interchanges along I-805, SR 905, and SR 56. Within the SRA a total of 483 acres would be developed with transportation improvements, 441 acres of which would be classified as VHFSZs. Planned transportation improvements include the straightening and widening of SR 76 and SR 78 east of I-15 and the improvement of I-15 from Escondido to the County line. Structures comprising these transportation facilities would be exposed to an elevated level of downslope risk from flash floods, debris flows, and landslides in the years following wildfires. This exposure would be a significant impact.

2050 Conclusion

Some regional growth and land use changes, and transportation projects, between 2036 and 2050 would occur in SRAs and VHFSZs within LRAs. The people, buildings. and structures, including transportation facilities,

situated in the areas classified as VHFSZs are, subsequent to recurring wildfires, subject to elevated levels of risk from flash floods, debris flows, and landslides. These risks are a significant impact.

Exacerbation of Climate Change Effects

Implementation of the proposed Plan could exacerbate climate change effects of exposing people or structures to significant risks as a result of runoff, post-fire slope instability, or drainage changes. The proposed Plan would increase development and thus impervious surfaces in downslope or downstream areas; these impervious surfaces could worsen impacts of flooding and runoff. Climate change is also expected to increase risk of flooding and landslides in the future due to increased frequency and intensity of extreme precipitation events. Furthermore, climate change may increase the potential for heavy rainfall to occur after wildfire, resulting in potential landslides as flooding washes away soil destabilized from wildfire (Bedsworth et al. 2018). Thus, the proposed Plan could expose more people and structures to increased flooding and landslide risks that would have been increased by climate change.

MITIGATION MEASURES

WF-3 EXPOSE PEOPLE OR STRUCTURES TO SIGNIFICANT RISKS, INCLUDING DOWNSLOPE OR DOWNSTREAM FLOODING OR LANDSLIDES, AS A RESULT OF RUNOFF, POST-FIRE SLOPE INSTABILITY, OR DRAINAGE CHANGES

2025, 2035, and 2050

WF-3 Reduce Post-Fire Risks Related to Flooding, Landslides, Slope Instability, or Drainage Changes for Development and Transportation Projects. During planning, design, and project-level CEQA review of development projects or transportation network improvement projects in SRAs or in LRAs classified as VHFHSZs, SANDAG shall, and the County of San Diego, cities, and other local jurisdictions can and should, ensure that project applicants work with local communities to implement measures to reduce post-fire impacts. Such measures include, but are not limited to, the following:

- Treating wildfire burned areas to control stormwater runoff prior to winter rains.
- Restoring wildfire areas by planting native vegetation cover or encouraging the regrowth of native species using best practices as soon as possible to aid in control of stormwater runoff.
- Reducing potential for future flood hazard by sufficient removal of dead, woody vegetation along watercourses following a catastrophic fire to reduce the risk of future catastrophic fires.
- Including fire hazard reduction measures that balance forest health with fuel-reducing activities while considering the potential effect on flood management.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Between 2016 and 2050 it is forecast that thousands of acres of land classified as SRA and/or VHFSZ would be converted from vacant land by land development or as a result of the development or transportation facilities. The converted land has been identified, because of slope, vegetation, and other factors, subject to high levels of risk from wildfires. Wildfire risks will increase due to continuing climate change and the resulting droughts. Climate change will also result in more severe rainfall events. These factors together would greatly increase

the risks of flash floods, debris flows, and landslides in the years following wildfires and would likely occur on a scale and in a timeframe that would preclude prevention by implementing mitigation measure WF-3. Because there are no feasible mitigation measures to reduce continued elevated risk of flash floods, debris flows, and landslides to less than significant, this impact (WF-3) remains significant and unavoidable.

5 CUMULATIVE IMPACT ANALYSIS

This chapter discusses the cumulative effects of past, present, and reasonably foreseeable future projects and the contribution of regional growth and land use change and transportation network improvements and programs included in the proposed Plan to these effects. The CEQA Guidelines define a cumulative impact as one in which two or more individual effects, when considered together, are considerable or can compound or increase other environmental impacts. Individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CEQA Guidelines Section 15355).

5.1 CUMULATIVE IMPACT METHODOLOGY

CEQA Guidelines Section 15130 describes the requirements for the discussion of cumulative impacts in an EIR, and states that an EIR will discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. The discussion must reflect the severity of impacts and their likelihood of occurrence, but the discussion need not provide as much detail as is provided for the impacts attributable to the project alone. In addition, the CEQA Guidelines allow for a project's contribution to be rendered less than cumulatively considerable with implementation of appropriate mitigation.

According to Section 15130(b) of the State CEQA Guidelines, cumulative impact analysis may be conducted using one of two methods: the List Method, which includes "a list of past, present, and probable activities producing related or cumulative impacts," or the Plan Method, which uses "a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact." For the purposes of this EIR, a combination of both methods is used for the cumulative analysis, as described below.

To analyze the cumulative effects of regional growth and land use and transportation network improvements and programs included in the proposed Plan per CEQA requirements, the following approach for each resource topic was applied:

1. Summarize the impacts of regional growth and land use change and transportation network improvements included in the proposed Plan on the resource.
2. Summarize projected impacts in related plans and impacts of probable future projects within the geographic scope of the cumulative impact analysis.
3. Discuss combined impacts and conclude whether cumulative impacts are significant, then explain whether the proposed Plan's incremental contribution to any significant cumulative impacts is cumulatively considerable and therefore significant.
4. Where the incremental contribution to a significant cumulative impact is cumulatively considerable, list mitigation measures that would reduce the incremental effects and determine whether they would make the impact less than significant. If none exist, conclude that the contribution to the cumulative impact remains significant and unavoidable.

5.1.1 CUMULATIVE PROJECTS

Several existing and probable future large-scale projects in the San Diego region are forecast to occur within the 2050 timeframe of the proposed Plan and could contribute to significant cumulative impacts . Past projects include those that have been recently completed but were not necessarily considered in the baseline for the proposed Plan and have ongoing impacts with the potential to combine with the impacts of other projects. Present and probable future projects include those that are under construction, in a preconstruction phase, or show a level of assurance that the project will move forward, such as allocated funding or movement through the necessary planning process for project approval. These projects have independent utility from the proposed Plan, and do not rely on it for their justification. Some of these projects span beyond the boundaries of the San Diego region, have uncertain funding, and/or have no preliminary designs. These projects are described below.

California High-Speed Rail LA-SD Segment

The California High-Speed Rail Authority (HSRA) has developed plans for an 800-mile system that includes nine corridors connecting California's major metropolitan areas. Trains would reach speeds in excess of 200 miles per hour (mph) in more rural areas on a dedicated, fully grade-separated system, making it possible to travel from San Diego to Los Angeles in less than 80 minutes and San Diego to San Francisco in less than 4 hours. Figure 5-1 depicts a statewide map of the California High Speed Rail Train (HST) project, as well as four options for the San Diego region.

The High Speed Rail project has independent utility and is not a component of the proposed Plan. Responsibility for the HST belongs to HSRA; SANDAG does not have authority over the alignment, design, or funding of the HST.

The high-speed corridor serving the San Diego region runs from southwest Riverside County along the Interstate (I-) 15 corridor, with a key intermodal transit station planned in the City of Escondido. The Los Angeles-San Diego route is currently in Stage 2 of Planning, that is, the Alternatives Analysis. A proposed schedule for implementation is not available and timing could depend on funding (HSRA 2014).

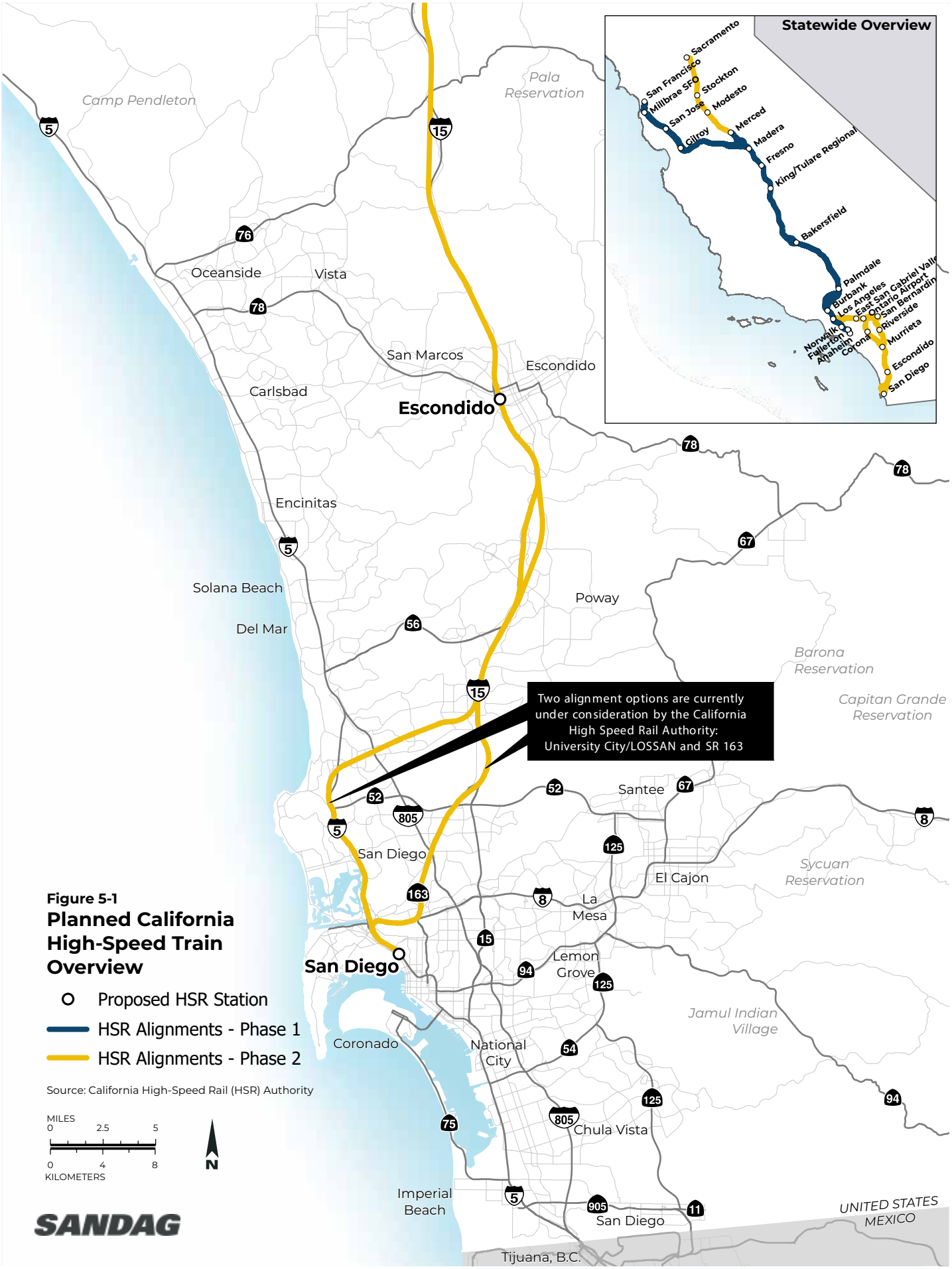
Navy Old Town Campus Revitalization

The United States (U.S.) Department of the Navy (Navy) prepared a Draft Environmental Impact Statement (EIS) to evaluate the potential environmental consequences of the proposed modernization of Naval Base Point Loma Old Town Campus (OTC), San Diego, California. OTC is home to the Naval Information Warfare Systems Command (NAVWAR) (Navy 2021). The Navy analyzed five alternatives, and identified Alternative 4 – high density development with a transit center – as its preferred alternative. This transit center could be the Central Mobility Hub, which is included as a part of the proposed Plan.

The proposed modernization of NAVWAR's facilities on OTC would include demolition, construction, and renovation of buildings, utilities, and infrastructure. Modernization would be accomplished in either of two ways:

1. Navy Redevelopment: A Navy-only project that would construct new or renovate existing NAVWAR facilities at OTC. No public-private or mixed-use development would occur on OTC under this scenario.
2. Public-private Redevelopment: Collaboration between the Navy, the private sector, and possibly other government agencies to finance and construct new NAVWAR facilities at OTC. Development would include

new facilities for NAVWAR and a range of private mixed-use development (e.g., residential, office, retail, hotel). The developers of the mixed-use development would pay for construction of NAVWAR facilities in exchange for the opportunity to develop the remaining OTC land. Two of the action alternatives analyzed in this EIS include consolidation of a transit center to OTC.


Statewide Overview
Sacramento
San Francisco
Millbrae SFO
Stockton
San Jose
Modesto
Gilroy
Merced
Madera
Fresno
King/Tulare Regional
Bakersfield
Palmdale
Burbank
Los Angeles
East San Gabriel Valley
Ontario Airport
San Bernardino
Riverside
Norwalk
Fullerton
Anaheim
Corona
Murrieta
Escondido
San Diego
Camp Pendleton
Pala Reservation
Oceanside
Vista
San Marcos
Escondido
Carlsbad
Encinitas
Solana Beach
Del Mar
Poway
Barona Reservation
Capitan Grande Reservation
Two alignment options are currently under consideration by the California High Speed Rail Authority: University City/LOSSAN and SR 163
Santee
San Diego
El Cajon
Sycuan Reservation
La Mesa
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 5-1
Planned California High-Speed Train Overview
Proposed HSR Station
HSR Alignments - Phase 1
HSR Alignments - Phase 2
Source: California High-Speed Rail (HSR) Authority
MILES
0
2.5
5
0
4
8
KILOMETERS
N
SANDAG

Air Transportation

San Diego ~~County~~ International Airport Development Plan

Each year, more than ~~1,817~~25 million air passengers use the San Diego International Airport (SDIA).

~~The air cargo capacity at SDIA is currently constrained by limited infrastructure.~~ To maximize the airport's operational efficiency and make the most of the airport's 661-acre footprint, SDIA is moving forward with its next master planning phase, the Airport Development Plan (ADP). The ADP provides a development framework to implement improvements that will enable the San Diego County Regional Airport Authority (SDCRAA) to accommodate future demand for air travel that is anticipated to occur at SDIA with more modern, efficient, and comfortable facilities. The ADP is considered a probable future project for the cumulative impact analysis.

The primary components of the project are the replacement of the existing Terminal 1, ~~modifications to Terminal 2,~~ a new administration building, and a new airport access roadway with new bicycle and pedestrian infrastructure. As part of the Terminal 1 replacement, a new ~~access road and~~ parking structure would also be constructed. ~~Other improvements include infrastructure upgrades and the removal/relocation of other airport support facilities to accommodate the terminal improvements.~~ Ultimately, the number of gates at SDIA would increase from 51 to 62~~1~~ (SDCRAA 2019a).

City of San Diego Pure Water North City Project

The City of San Diego is implementing the North City Project, which is the first phase of the Pure Water San Diego Program (Pure Water Program). It involves the production of 30 million gallons per day (MGD) of purified water. The North City Project will expand the existing North City Water Reclamation Plant (NCWRP) and construct an adjacent North City Pure Water Facility (City of San Diego 2018). Two alternative purified water pipelines are considered: one to Miramar Reservoir and one to San Vicente Reservoir. Other project components include a new pump station and forcemain to deliver additional wastewater to the NCWRP, a brine/centrate discharge pipeline, upgrades to the existing Metro Biosolids Center, a new North City Renewable Energy Facility at the NCWRP, and a new Landfill Gas (LFG) Pipeline between the Miramar Landfill gas collection system and the NCWRP.

The North City Project includes a variety of facilities located throughout the central coastal areas of San Diego County in the North City geographic area. A new pure water facility and three pump stations would be located within the corporate boundaries of the City of San Diego. Proposed alternative pipelines would traverse a number of local jurisdictions, including the cities of San Diego and Santee, and the community of Lakeside and other areas in unincorporated San Diego County. The proposed LFG Pipeline would traverse federal lands within Marine Corps Air Station (MCAS) Miramar.

South County Traffic Relief Effort Project

The California Department of Transportation (Caltrans), in partnership with the Foothill/Eastern Transportation Corridor Agency, is planning to extend Los Patrones Parkway from Cow Camp Road to Avenida La Pata, in Orange County. This project replaces the former SR 241 Tesoro Extension project that would have extended the current 241 Toll Road from where it now ends at Oso Parkway to Cow Camp Road in the vicinity of Ortega Highway within Orange County. An addendum to Final Environmental Impact Report (FEIR) 589 (Ranch Plan), which was certified on November 6, 2001, FEIR 584 (SSNCCP/MSAA/HCP), which was certified on October 24, 2006, and FEIR 575 (Prima Deshecha General Development Plan), which was certified on

November 8, 2004, was prepared for this project and a Notice of Determination was filed by the Orange County Public Works Department on January 12, 2021.

Port/Maritime

Currently, the Unified Port District of San Diego (Port) is in the process of updating their long-range integrated master plan, known as the Port Master Plan Update (PMPU), that provides the official goals and planning policies, and identifies permissible land and water uses, for development and conservation of the Port lands, tidelands, and submerged lands through the next 30 years (2050) for seven out of the ten planning districts within the PMPU area. The PMPU identifies planned improvements, including appealable and non-appealable development, for each planning district and would include the addition of new hotel and retail space as well as improvements to the public access and recreational resources, and in-water features such as additional recreational boat berthing space. A revised Draft PMPU was released for public review from October 20, 2020, through November 17, 2020, and a program EIR is currently being prepared with an anticipated public review period in late 2021 (Port 2021).

The three planning districts not being updated as part of the PMPU are Planning District 5: National City Bayfront, Planning District 6: Chula Vista Bayfront, and the Pone 20 portion of Planning District 7: South Bay. These planning districts have undergone, or are currently undergoing, separate planning processes with their own environmental review. The National City Bayfront is currently being planned under the National City Bayfront Projects & Port Master Plan program with the EIR public review period anticipated for late 2021. The Chula Vista Bayfront has an approved land use plan for the entire planning district that is currently under implementation, and no changes are proposed to that land use plan. The Final EIR for the Chula Vista Bayfront project was certified in April 2010. In addition, the District-owned property in the southern portion of Pond 20 and adjacent parcels were evaluated under the Wetland Mitigation Bank at Pond 20 Project EIR and Port Master Plan Amendment for the creation of a wetland mitigation bank and to incorporate the property into the Port Master Plan, which was certified by the Board of Port Commissioners on April 13, 2021, and is currently planned to be presented before the Coastal Commission for approval.

In addition, in 2016, the Port adopted a redevelopment plan for the Tenth Avenue Marine Terminal, which would involve a variety of infrastructure investments that may be undertaken over the long term to accommodate an increase of the marine terminal's capabilities and capacity. These include up to five gantry cranes, additional and consolidated dry bulk storage capacity (which may include a new 100,000-square-foot dry bulk structure or an equivalent vertical storage facility), enhancements to the existing conveyor system, demolition of the molasses tanks and Warehouse C, additional open storage space, establishment of an on-dock rail facility, a centralized gate facility, and the Demolition and Initial Rail Component. The Final EIR for this project was certified on December 13, 2016 (Port 2016).

Other Probable Future Projects

For some resource topic areas, additional large-scale probable future projects are also considered in the cumulative impact analysis. For example, for cumulative aesthetics and visual resources impacts, impacts of future long linear projects such as rail pipeline or energy transmission infrastructure are considered.

5.1.2 REGIONAL PLANNING DOCUMENTS

This analysis considers documents, studies, and plans that have been produced by various agencies and organizations describing or evaluating conditions contributing to cumulative impacts. For some of these

documents, EIRs or EISs have been prepared that describe environmental impacts of plan implementation. Available information in adopted plans or certified environmental documents is used to describe existing and future conditions that may contribute to cumulative impacts. In some cases planning documents are included that have been prepared by local jurisdictions, including cities and other agencies that have applicability to planning efforts or other topic areas throughout the region, such as local general plans and their various elements, resource protection ordinances, and climate action plans. In some cases, the impacts of local plans are already addressed and accounted for in SANDAG and Southern California Association of Governments (SCAG) EIRs.

Documents that have application across multiple resource topics are listed below; additional planning documents are referenced when used within a specific resource topic analysis.

- Southern California Association of Governments: 2020-2040 Regional Transportation Plan/Sustainable Communities Strategy (SCAG 2020a)
- California Air Resources Board: California's 2017 Climate Change Scoping Plan (CARB 2017)
- California Department of Transportation: California-Baja California Border Master Plan (Caltrans 2021)
- Unified Port of San Diego: San Diego Unified Port District Master Plan (Port 2020)
- San Diego County Regional Airport Authority: Regional Aviation Strategic Plan (RASP) (SDCRAA 2011b)
- San Diego International Airport: Airport Master Plan (SDCRAA 2008); Aviation Activity Forecasts (SDCRAA 2019b)
- SANDAG: San Diego Airport Multimodal Accessibility Plan (SANDAG 2012); 2050 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (SANDAG 2011a) and associated EIR (SANDAG 2011b); 2050 Goods Movement Strategy (incorporated in SANDAG 2011a)
- U.S. Environmental Protection Agency: The U.S.-Mexico Border Environmental Program: Border 2025 (EPA 2021)
- United States Marine Corps: MCB Camp Pendleton Integrated Natural Resources Management Plan (MCB Camp Pendleton 2017); MCAS Miramar Integrated Natural Resources Management Plan (MCAS Miramar 2018)
- Bureau of Land Management: Eastern San Diego County Resource Management Plan (BLM 2007)
- United States Department of Agriculture: Cleveland National Forest Plan (USDA 2006)
- 2034 Tijuana, Tecate, and Playas de Rosarito Metropolitan Strategic Plan (IMPLAN 2013)
- San Diego County Water Authority 2013 Regional Water Facilities Optimization and Master Plan Update (SDCWA 2014)
- San Diego Gas & Electric Company 2012 Long-Term Procurement Plan (SDG&E 2012)

5.1.3 GROWTH PROJECTIONS

This analysis considers population projections gathered from a variety of sources, in addition to the projections contained in adopted plans, to understand and characterize the cumulative setting. Population projections include:

- SANDAG Series 14 Regional Growth Forecast used as the basis for proposed Plan

- SCAG's 2020 RTP/SCS Growth Forecast
- California Department of Finance Population Projections (DOF 2019)
- 2021 Border Master Plan

Population projections from these sources are provided in Table 5-1 for the 2025, 2035, and 2050 horizon years.

Table 5-1
Growth Projections Considered in the Cumulative Impacts Analysis

Region	Population			
	2016	2025	2035	2050
SANDAG	3,309,510	3,470,848	3,620,348	3,746,073
SCAG region	18,832,000	19,432,587	21,443,000	20,179,646
Northern Baja	3,484,150	4,169,240	5,357,1222	5,617,7742
State of California	39,254,339	40,808,001	42,718,403	44,049,015

Sources: SANDAG = SANDAG Series 14 Regional Growth Forecast (SANDAG 2021); SCAG = SCAG 2020-2045 RTP/SCS Demographics and Growth Forecast (for 2016, 2035), (SCAG 2020a); DOF 2021 for 2025 and 2050; Northern Baja = 2021 Border Master Plan (2021); SANDAG 2015; State of California = California Department of Finance (DOF 2021).
Note: Northern Baja California generally includes the municipalities of Tijuana, Tecate, Playas de Rosarito, parts of Mexicali, and Ensenada.

5.1.4 GEOGRAPHIC SCOPE

The geographic scope defines the area in which the impacts of the proposed Plan are analyzed in combination with similar impacts of cumulative projects or impacts associated with approved planning documents to determine if cumulative impacts would occur. For the purposes of this EIR, the geographic scope for cumulative impacts analysis is shown in Table 5-2. The cumulative impact analysis section for each resource topic area explains why the specific geographic scope was selected.

Table 5-2
Topic Specific Geographic Scope of Cumulative Impacts

Cumulative Impact Topic	Geographic Scope
Aesthetics and Visual Resources	Southern California/Northern Baja California
Agricultural and Forestry Resources	California
Air Quality	Southern California/Northern Baja California
Biological Resources	Southern California/Northern Baja California
Cultural and Paleontological Resources	Southern California/Northern Baja California
Energy	Southern California/Northern Baja California
Geology, Soils, and Mineral Resources	Southern California/Northern Baja California
Greenhouse Gas Emissions	Global
Hazards	Southern California/Northern Baja California
Hydrology and Water Quality	Southern California/Northern Baja California
Land Use	Southern California
Noise and Vibration	Southern California/Northern Baja California

Cumulative Impact Topic	Geographic Scope
Population and Housing	Southern California/Northern Baja California
Public Services and Utilities	Southern California/Northern Baja California
Transportation	Southern California/Northern Baja California
Water Supply	State of California/Lower Colorado River Basin/ Northern Baja California

Note: Southern California generally includes the areas encompassed by SANDAG and SCAG jurisdictions. SCAG represents six Southern California counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) over an area covering more than 38,000 square miles. Northern Baja California generally includes the municipalities of Tijuana, Tecate, Playas de Rosarito, parts of Mexicali, and Ensenada.

5.2 CUMULATIVE IMPACT ANALYSIS

5.2.1 AESTHETICS AND VISUAL RESOURCES

C-AES-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON AESTHETIC AND VISUAL RESOURCES

The area of geographic consideration for cumulative impacts on aesthetics and visual resources is the Southern California and northern Baja region. While diverse, this region contains a similar variety of viewsheds, landscapes, and visual character. Aesthetic effects extend across jurisdictional boundaries and can potentially have wide-ranging impacts. Northern Baja is appropriate to include as there are expansive views of the southern San Diego region from higher elevations throughout Tijuana.

A hybrid approach for the cumulative analysis of aesthetics and visual resources allows for the discussion of visual change associated with general patterns of regional urbanization, growth, and land use change while also incorporating more precise visual effects caused by specific major development and infrastructure projects. The cumulative impact is the combination of the impacts of the proposed Plan, aesthetic impact projections in adopted plans, and impacts on aesthetics and visual resources resulting from large-scale existing and probable future projects. Significant cumulative impacts related to aesthetics and visual resources would occur if there were a substantial cumulative impact on scenic vistas, scenic resources, or degradation of the character of an area, including the addition of visual elements of urban character to an existing rural or open space area or by creating substantial new sources of light or glare that would adversely affect day or nighttime views.

This cumulative impact assessment considers and relies on the impact analysis within this EIR for the proposed Plan and SCAG's 2020–2045 RTP/SCS Final EIR (SCAG 2020b) for the Southern California region including Los Angeles, Orange County, Riverside, and San Bernardino County. The 2020–2045 SCAG RTP/SCS planning horizon is 2045; thus, the analysis does not account for the plan's year 2050 impacts. There are no regional plans pertaining to aesthetics and visual resources for the northern Baja California region, except for the 2021 Border Master Plan, which provides a general land use description of the U.S/Mexico border region (Caltrans 2021).

Impacts of the Proposed Plan

The analysis within this EIR concludes that development associated with regional growth and transportation network improvements would result in new infrastructure and development that would interrupt or detract from a scenic vista, block panoramic views, or views of significant landscape features or landforms (Impact AES-1). Additionally, new development and infrastructure would occur near scenic resources, including historic buildings and scenic rock outcroppings, and could damage these scenic resources (Impact AES-2).

Implementation of the proposed Plan would also result in land use changes and the construction of transportation network improvements that would substantially degrade the character of an area, including adding a visual element of urban character to an existing rural or open space area and the addition of new light and glare sources (Impacts AES-3 and AES-4, respectively). These visual impacts would occur within each horizon year analyzed (2025, 2035, and 2050). Therefore, these impacts related to aesthetics and visual resources as a result of the proposed Plan are significant.

Impacts of Related Projects

The Southern California and northern Baja region is an area of abundant and varied scenic resources. The topography, panoramic views, scenic roadways, open spaces, and significant landscape features found throughout this region contribute greatly to the overall character and quality of the existing visual setting. Projects planned in the Southern California and northern Baja region, such as the Navy OTC Revitalization Project, SDIA Airport Development Plan, HST, border/Port of Entry (POE) facility improvements, port/maritime improvements associated with the PMPU, or long linear projects such as rail pipeline or energy transmission infrastructure, would result in impacts related to blocking panoramic views or views of significant landscape features or landforms, and/or result in degradation of visual character and the addition of new light and glare sources. For example, the HST project in the San Diego region would result in bridges or elevated guideways or other features that may introduce visual contracts that could block existing views or result in shadow impacts (HSRA 2005). The EIR/EIS prepared for the HST project determined that the project would result in significant cumulative impacts on aesthetic and visual resources. The EIR for the SDIA Airport Development Plan identified aesthetic impacts, but found them to be less than significant (SDCRAA 2019).

The EIS for the Navy OTC Revitalization Project evaluated several alternatives and determined that the project would result in significant impacts on aesthetics and visual resources associated with the construction of new facilities for NAVWAR along with private mixed-use development with buildings up to 240 feet tall. The SCAG 2020-2045 RTP/SCS EIR analyzed project environmental effects of the proposed Plan in the Southern California region. The EIR found potential aesthetic impacts on scenic vistas, scenic resources, and light or glare to be significant and unavoidable. Thus, some of these related projects would have adverse effects on aesthetic and visual resources in the San Diego region in 2025, 2035, and 2050.

Impact Projections in Adopted Plans

The SCAG 2020-2045 RTP/SCS EIR identified significant impacts on visual resources. By increasing mobility and including land-use-transportation measures that influence the pattern of future development, the 2020-2045 RTP/SCS would obstruct views of scenic resources or scenic vistas; alter the appearance of scenic resources along or near designated scenic highways and vista points; create significant contrasts with the overall visual character of the existing landscape setting or add urban visual elements to an existing natural, rural, and open space area; and result in shade/shadow or light and glare impacts. At the regional scale, the 2020-2045 RTP/SCS EIR identified cumulatively significant impacts on the overall visual character of the existing landscape setting (SCAG 2020b).

Adopted land use plans and ordinances for local jurisdictions in Southern California would support the construction of new development and redevelopment through policy changes, general plan updates, and zoning amendments that encourage and facilitate growth and land use changes. As outlined for local jurisdictions in the San Diego region in Table 4.1-3, visual resource protection ordinances often exist at the local level, and local land use plans often contain policies related to design guidelines and review. All discretionary projects would

be subject to these local visual resource protection ordinances, design guidelines, and building requirements/restrictions.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan, the related projects, and impact projections from adopted plans within the Southern California and northern Baja region were significant when considered together, even if not independently significant. The forecasted regional growth and land use changes, coupled with the transportation network improvements included in the proposed Plan for 2025 would result in significant impacts related to aesthetic and visual resources through substantial adverse effect on scenic vistas, damage to scenic resources within a state scenic highway, and degradation of visual character of an area. The introduction of new light sources that would affect dark skies would also be significant.

In addition, significant aesthetic and visual impacts were also identified in the HST project environmental analysis and in the SCAG 2020-2045 RTP/SCS EIR. The Port, SDCRAA, and Navy projects would also have adverse aesthetic and visual impacts, such as future POE projects, airport, and maritime improvements associated with Port for All. Therefore, the combination of the direct and cumulative aesthetic and visual resource–related impacts from these projects and SCAG's adopted 2020-2045 RTP/SCS that would affect the Southern California and northern Baja region would result in significant cumulative aesthetic and visual impacts, based on Impact AES-1 regarding scenic vistas, Impact AES-2 regarding scenic resources within a state scenic highway, Impact AES-3 regarding substantial degradation of the visual character of an area by 2025, and Impact AES-4 regarding light and glare impacts.

Because cumulative aesthetic and visual resource impacts throughout the Southern California and northern Baja region by 2025 would be significant, and because the proposed Plan's incremental aesthetic and visual resource impacts are significant, the proposed Plan's incremental aesthetic and visual resource impacts are also cumulatively considerable (Impact C-AES-1).

2035

The cumulative analysis presented above for year 2025 would be applicable to year 2035, and significant impacts on aesthetic and visual resources are anticipated. By 2035, increases in regional growth, land use changes, and the number of transportation network improvements implemented over those that occurred by 2025 would result in additional adverse impacts on panoramic views, views of significant landscape features, scenic highways, visual character, and light and glare. The combination of the direct and cumulative aesthetic and visual resource–related impacts from the projects and adopted plans described above that would affect the Southern California and northern Baja region would result in significant cumulative aesthetic and visual impacts, based on Impact AES-1 regarding scenic vistas, Impact AES-2 regarding scenic resources within a state scenic highway, Impact AES-3 regarding substantial degradation of the visual character of an area by 2035, and AEA-4 regarding light and glare impacts.

Because cumulative aesthetic and visual resource impacts throughout the Southern California and northern Baja region by 2035 would be significant, and because the proposed Plan's incremental aesthetic and visual resource impacts are significant, the proposed Plan's incremental aesthetic and visual resource impacts are also cumulatively considerable (Impact C-AES-1).

2050

The cumulative analysis presented above for years 2025 and 2035 would be applicable to year 2050, and significant impacts on aesthetic and visual resources would occur. By 2050, increases in regional growth, land use changes, and the number of transportation network improvements implemented over those that occurred by 2025 and 2035 would result in additional opportunities for adverse impacts on panoramic views, views of significant landscape features, scenic highways, visual character, and light and glare to occur. The 2050 time period is beyond the planning horizon of the adopted SCAG 2020-2045 RTP/SCS. However, with long-term growth and development throughout the region, similar land use impacts would likely continue throughout the region. The combination of the direct and cumulative aesthetic and visual resource–related impacts from the projects and adopted plans described above that would affect the Southern California and northern Baja region would result in significant cumulative aesthetic and visual impacts, based on Impact AES-1 regarding scenic vistas, Impact AES-2 regarding scenic resources within a state scenic highway, Impact AES-3 regarding substantial degradation of the visual character of an area by 2050, and AES-4 regarding light and glare impacts.

Because cumulative aesthetic and visual resource impacts throughout the Southern California and northern Baja region by 2050 would be significant, and because the proposed Plan's incremental aesthetic and visual resource impacts are significant, the proposed Plan's incremental aesthetic and visual resource impacts are also cumulatively considerable (Impact-C-AES-1).

Mitigation Measures

C-AES-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON AESTHETIC AND VISUAL RESOURCES

2025, 2035, and 2050

Mitigation measures to reduce aesthetic and visual resource impacts due to implementation of the proposed Plan as identified in Section 4.1 would be applicable to cumulative aesthetic and visual resource impacts as well.

Implementation of mitigation measures **AES-1a**, **AES-1b**, **AES-2a**, **AES-2b**, **AES-3a**, **AES-3b**, **AES-4a** and **AES-4b** would reduce significant impacts on scenic vistas, scenic resources within a state scenic highway, degradation of the visual character of an area, and light and glare. For each future project requiring mitigation (i.e., measures that go beyond what is required by existing regulations), mitigation measures such as those listed in Section 4.1 would help to reduce significant project-level visual resources impacts to less than significant, or the project's incremental impacts would remain significant and unavoidable where no feasible mitigation exists. However, the degree of future impacts and applicability, feasibility, and success of future mitigation measures cannot be ensured for each specific future project.

Additionally, the SCAG 2020-2045 RTP/SCS EIR includes a variety of mitigation measures aimed at providing requirements for visual improvement of transportation facilities and other development, minimizing construction within important viewsheds, and the development of visual development standards and guidelines. The EIR concluded that even with the implementation of mitigation, visual impacts would remain significant and unavoidable. Similarly, the HST environmental document includes a mitigation strategy to minimize building and shading of bridges and elevated guideways with the use of neutral colors and materials to blend with surrounding landscape features.

The HST EIR/EIS concluded that even with the implementation of mitigation, visual impacts would remain significant (HSRA 2005). While proposed mitigation would lessen aesthetic impacts, impacts on aesthetics from related projects would remain significant even with the application of mitigation.

Based on the above analysis, following mitigation of the effects of the proposed Plan, related projects, and adopted plans, cumulative impacts on aesthetic and visual resources would remain significant. Also, mitigation measures **AES-1a**, **AES-1b**, **AES-2a**, **AES-2b**, **AES-3a**, **AES-3b**, **AES-4a** and **AES 4b** would not reduce the proposed Plan's incremental impacts to less than significant. Therefore, the proposed Plan's incremental contributions to cumulative aesthetic and visual resource impacts would remain cumulatively considerable post-mitigation.

5.2.2 AGRICULTURE AND FORESTRY RESOURCES

C-AG-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON AGRICULTURAL AND FORESTRY RESOURCES

The area of geographic consideration for cumulative impacts on agriculture and forest resources is the state of California. Agriculture as a whole in California is important as the successful production of many crops is due to the distinctive climates found in the state. While variable by region, the state of California supports an extensive range of agricultural operations and opportunities.

A hybrid approach for cumulative analysis of agricultural and forest resources allows for an overarching discussion of regional loss of agricultural lands and forest resources associated with general patterns of regional urbanization, growth, and land use changes while also allowing for specific consideration of any projects with known impacts on agriculture. The cumulative impact is the combination of the impacts of the proposed Plan, agricultural and forest resources impact projections in adopted plans, and impacts on agricultural and forest resources resulting from probable future projects. Significant cumulative impacts related to agriculture resources would occur if there were a cumulative loss of existing agriculture resources, including conversion of agricultural lands to nonagricultural use and conflicts with Williamson Act contracts and lands zoned for agricultural use. Significant cumulative impacts related to forest lands would occur if there were a cumulative loss or conversion of forest land as defined in the California Forest Legacy Act of 2007 (Public Resources Code [PRC] Section 12220(g)).

There is an ongoing trend of decreased acres of land in agricultural production in California. The most recent California Farmland Conversion Report (2014–2016) issued by the California Department of Conservation found that irrigated farmland in California decreased by 11,165 acres between 2014 and 2016 (DOC 2019). In the San Diego region, land in commercial agricultural crop production decreased from over 312,000 acres in 2008 to less than 304,000 acres in 2012 (County of San Diego 2013). In the nearby Imperial Valley, areas of crop production served by the Imperial Irrigation District decreased from 502,039 acres in 2004 to 457,695 acres in 2013 (IID 2004, 2013).

Impacts of the Proposed Plan

The forecasted regional growth and land use change and planned transportation network improvements associated with the proposed Plan would convert agricultural lands to nonagricultural use between 2016 and 2025 (6,458 acres), between 2026 and 2035 (804 acres), and between 2036 and 2050 (923 acres), for a total of 8,186 acres cumulatively between 2016 and 2050, as detailed in Section 4.2. Implementation of the proposed

Plan would also decrease the viability of agriculture on agriculturally designated land. This would be a significant impact on agricultural resources in 2025, 2035, and 2050 (Impact AG-1).

Additionally, regional growth and land use change and transportation network improvements would conflict with lands zoned for agriculture (1,167 acres between 2016 and 2025, 175 acres between 2026 and 2035, and 18 acres between 2036 and 2050, for a cumulative total between 2016 and 2050 of 1,360 acres) and lands under Williamson Act contract (732 acres between 2016 and 2025, 120 acres between 2026 and 2035, and 1 acre between 2036 and 2050, for a cumulative total between 2016 and 2050 of 853 acres) . This would be a significant impact on agricultural resources in 2025, 2035, and 2050 (Impact AG-2).

Regional growth and land use change would result in new development that would result in the loss of existing forest lands. Proposed transportation network improvements also would require ground-disturbing activities such as brush clearing, grading, trenching, excavation, and/or soil removal that would result in the loss of forest lands. Development associated with regional growth and land use change and transportation network improvements together would result in a direct loss of forest land between 2016 and 2025 (1,170 acres), between 2026 and 2035 (183 acres), and between 2036 and 2050 (13 acres), for a cumulative total between 2016 and 2050 of 1,366 acres. This would be a significant impact (Impact FR-1).

Impacts of Related Projects

Other related regional projects, such as the HST, would have similar types of impacts as identified for the proposed Plan transportation improvements. The programmatic environmental document for the HST identified a potentially significant impact related to agriculture and forest resources for the segments planned for the Southern California region. Implementation of the HST is ongoing and being conducted in phases (HSRA 2005). The EIRs for the SDIA Airport Development Plan Project and the Navy OTC Revitalization Project did not evaluate agricultural impacts as this resource area was determined to not be significant (SCDRAA 2019a, Navy 2021)

Other land development and infrastructure projects throughout the region and state, such as petroleum pipeline transportation infrastructure, and freight rail infrastructure, and energy generation and transmission corridors, would also impact agriculture and/or forest resources if these projects expand the right-of-way (ROW) of highway or rail lines and convert agricultural uses or forest lands to other uses.

The Caltrans South County Traffic Relief Effort Project will extend Los Patrones Parkway from Cow Camp Road to Avenida La Pata, in Orange County. This project replaces the former State Route (SR) 241 Tesoro Extension Project that would have extended the current 241 Toll Road from where it now ends at Oso Parkway to Cow Camp Road in the vicinity of Ortega Highway within Orange County. The environmental process for this project is underway, but because the project would be constructed in the same corridor, it could impact similar resources.

The SR 241 Tesoro Extension Project analyzed project environmental effects in an Addendum to the South Orange County Transportation Infrastructure Improvement Project Final Subsequent EIR. The addendum found the project would not result in more severe agricultural impacts than identified in the EIR, which found significant and unavoidable agricultural impacts. The addendum stated that farmlands within and immediately adjacent to the SR 241 Tesoro Extension Project alignment are limited to cattle grazing areas and no existing forestry resources or zoning for forest land exists within the extension project area (Foothill/Eastern Transportation Corridor Agency 2013).

Impact Projections in Adopted Plans

In the Southern California region, the EIR prepared for the 2020-2045 SCAG RTP/SCS identified impacts related to the loss of agricultural and forest lands due to new transportation infrastructure and associated land development, particularly those constructed outside of urbanized areas where new urban uses could be located on agricultural or forest lands. Additionally, the EIR found that the contribution of the 2020-2045 SCAG RTP/SCS to agricultural and forest impacts would be cumulatively considerable, as the conversion of agricultural land resulting from changes in regional land use patterns has the potential to set a precedent that would affect areas outside the region resulting in the conversion of agricultural lands (SCAG 2021b). The 2020-2045 SCAG RTP/SCS planning horizon is 2045. This document and analysis do not account for year 2050 impacts.

Adopted land use plans for local jurisdictions throughout the state of California may enact land pattern changes and zoning amendments that encourage and facilitate new urban development. Some of the land use changes would convert agriculture or forest resources to other uses. Additionally, adopted plans for improvements to arterial networks that widen streets or add or expand transportation facilities, especially those in new or nonurbanized areas, would also convert agriculture or forest resources to other uses.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan, the related projects, and impact projections from adopted plans within the Southern California and northern Baja region were significant when considered together, even if not independently significant. As described above, implementation of the regional growth and land use changes and transportation network improvements associated with the proposed Plan in 2025 would significantly impact agriculture resources through the conversion of agricultural lands to nonagricultural use and conflicts with existing zoning agricultural uses and Williamson Act contracts. Also, significant impacts were identified for the loss of forest land due to proposed Plan implementation.

As discussed above, significant impacts on agriculture and forest resources have been identified in project-specific environmental documents such as the HST project EIR/EIS and also in the environmental analysis for adopted planning documents. Other related infrastructure projects and land use plans across the state may also contribute to substantial impacts on agriculture and forest resources in a manner similar to the proposed Plan through the expansion of urban uses into areas of agriculture or forest use. The combination of the direct impacts from individual projects and adopted plans would result in significant cumulative impacts on agriculture and forest resources throughout the state of California by 2025.

Because cumulative impacts on agriculture and forest resources throughout the state by 2025 would be significant, and because the proposed Plan's incremental impacts on agriculture and forest resources are significant, the proposed Plan's incremental impacts on agriculture and forest resources are also cumulatively considerable in 2025 (Impact C-AG-1).

2035

Similar to the analysis for 2025, implementation of the regional growth and land use changes and transportation network improvements associated with the proposed Plan in 2035 would significantly impact agriculture resources through the conversion of agricultural lands to nonagricultural use and conflicts with

existing zoning agricultural uses and Williamson Act contracts. Also, significant impacts were identified for the loss of forest land due to proposed Plan implementation.

Significant impacts on agriculture and forest resources have been identified in project-specific environmental documents such as the HST project EIR/EIS and also in the environmental analysis for adopted planning documents. Other associated infrastructure projects and land use plans across the state may also contribute to substantial impacts on agriculture and forest resources in a manner similar to the proposed Plan through the expansion of urban uses into areas of agriculture or forest use. The combination of these impacts would result in significant cumulative impacts on agriculture and forest resources throughout the state of California by 2035.

Because cumulative impacts on agriculture and forest resources throughout the state by 2035 would be significant, and because the proposed Plan's incremental impacts on agriculture and forest resources are significant, the proposed Plan's incremental impacts on agriculture and forest resources are also cumulatively considerable in 2035 (Impact C-AG-1).

2050

Similar to the analysis for 2025, implementation of the regional growth and land use changes and transportation network improvements associated with the proposed Plan in 2050 would significantly impact agriculture resources through the conversion of agricultural lands to nonagricultural use and conflicts with existing zoning agricultural uses and Williamson Act contracts. Also, significant impacts were identified for the loss of forest land due to proposed Plan implementation.

As noted above, significant impacts on agriculture and forest resources have been identified in project-specific environmental documents such as the HST project EIR/EIS and also in the environmental analysis for adopted planning documents. Other associated infrastructure projects and land use plans across the state may also contribute to substantial impacts on agriculture and forest resources in a manner similar to the proposed Plan through the expansion of urban uses into areas of agriculture or forest use. The combination of these impacts would result in significant cumulative impacts on agriculture and forest resources throughout the state of California by 2050 (Impact C-AG-1).

Mitigation Measures

C-AG-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON AGRICULTURAL AND FORESTRY RESOURCES

2025, 2035, and 2050

Mitigation measure **AG-1a** calls for the preservation of existing agricultural lands through avoidance when feasible, and if not feasible, through acquisition or dedication of agricultural conservation easements (Measure **AG-1a** also applies to projects that would require cancellation of a Williamson Act contract). Mitigation measure **AG-1b** reduces conflicts with agricultural operations through the implementation of project design features and mitigation measures to protect surrounding agriculture. However, there is no assurance that the agricultural impacts of all land use changes and transportation network improvement projects implementing the proposed Plan would be reduced to less-than-significant levels by these measures.

Mitigation measure **FR-1** calls for the preservation of forest lands through avoiding conversion of forest lands when feasible and, if not feasible, through the implementation of measures to reduce impacts on forest lands.

In addition, mitigation measures **BIO-1a**, **BIO-1b**, and **BIO-1e** as identified in the biological resources analysis below would minimize impacts. However, there is no assurance that the impacts of all development and transportation network improvement projects implementing the proposed Plan would be reduced to less-than-significant levels by these measures.

The SCAG 2020-2045 RTP/SCS EIR includes multiple mitigation measures to reduce impacts on agricultural resources and farmland, including avoidance of farmlands in project design; development of regional guidelines for farmland buffering; and establishment of programs to direct growth to less agriculturally valuable lands, promote infill development to minimize development of agricultural lands, and conservation easement programs to mitigate prime farmland impacts. The EIR concludes that while these mitigation measures would reduce impacts on agricultural resources, they would not reduce impacts to a less-than-significant level, and impacts would remain significant (SCAG 2020b).

The 2005 EIR/EIS for the HST includes a number of mitigation strategies to reduce impacts on both agriculture resources and sensitive vegetation communities such as forest lands. The EIR concludes that impacts on agricultural lands and biological resources would remain significant, even with the application of mitigation strategies (HSRA 2005).

Based on the above analysis, following mitigation of the effects of the proposed Plan, related projects, and adopted plans, cumulative impacts on agricultural and forestry resources would remain significant. Also, the proposed mitigation measures would not reduce the proposed Plan's incremental impacts to less than significant. Therefore, the proposed Plan's incremental contributions to cumulative agricultural and forestry resource impacts would remain cumulatively considerable post-mitigation.

5.2.3 AIR QUALITY

C-AQ-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO AIR QUALITY

Emissions of criteria air pollutants can travel substantial distances and are not confined by jurisdictional boundaries; rather they are influenced by large-scale climatic and topographical features. Thus, the geographic scope considered for cumulative impacts on air quality is the Southern California and northern Baja region.

A projection approach to air quality is appropriate given the air pollutant emissions resulting from the future overall transportation network improvements, increases in population, and necessary planned regional development.

The plans considered and relied on for this cumulative analysis include the SCAG 2020-2045 RTP/SCS and its EIR (SCAG 2020); the San Diego Air Pollution Control District (SDAPCD) 2016 Regional Air Quality Strategy Revision (2016 RAQS) (SDAPCD 2016a); SDAPCD 2020 San Diego Ozone State Implementation Plan (2020 SIP) (SDAPCD 2020); SDAPCD 2016 Eight-Hour O_3 Attainment Plan (2016 SIP) (SDAPCD 2016b); South Coast Air Quality Management District (SCAQMD) 2016 Air Quality Management Plan (AQMP) (SCAQMD 2016); Imperial County Air Pollution Control District (ICAPCD) Final 2009 8 Hour Ozone Modified Air Quality Management Plan (ICAPCD 2010); U.S. Environmental Protection Agency (EPA) Border 2025 Program, Master Action Plan for California-Baja California (EPA 2013); 2034 Tijuana, Tecate, and Playas de Rosarito Metropolitan Strategic Plan (IMPLAN 2013); and California-Baja California Border Master Plan (Caltrans 2021).

Significant cumulative impacts related to air quality would occur if emissions would conflict with or obstruct implementation of the Regional Air Quality Strategy and/or State Implementation Plan; result in a cumulatively

considerable net increase in nonattainment or attainment criteria pollutants, including VOC, NOx, PM10, PM2.5, and SOx; result in construction-related emissions above regional mass emission thresholds; expose sensitive receptors to substantial PM10 and PM2.5 concentrations; expose sensitive receptors to substantial TAC concentrations; expose sensitive receptors to carbon monoxide hot spots; and result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Impacts of the Proposed Plan

The proposed Plan would result in less-than-significant impacts related to conflicting with or obstructing the implementation of the 2016 RAQS, 2016 SIP, and 2020 SIP~~, and would result in less-than-significant impacts related to exposure of sensitive receptors to carbon monoxide hot-spots and to other emissions such as odors, that could adversely affect a substantial number of people~~ (Impact AQ-1). While the proposed Plan would result in less-than-significant impacts related to a cumulatively considerable net increase in criteria pollutant emissions in 2025 and 2035; by 2050, the proposed Plan would result in a cumulatively considerable net increase in respirable particulate matter (PM10) and sulfur oxides (SO_X) emissions (Impact AQ-2). In addition, the proposed Plan would result in significant and unavoidable impacts related to construction-related emissions exceeding (Impact AQ-3) and exposure of sensitive receptors to substantial PM10 concentrations in 2025, 2035, and 2050 (Impact AQ-4). The proposed Plan would expose new sensitive receptors to substantial toxic air contaminant (TAC) concentrations in 2025 and 2035, while exposing certain existing sensitive receptors, as well as new receptors, to substantial concentrations of TAC emissions in 2050 (Impact AQ-5). The proposed Plan would result in less-than-significant impacts related to exposure of sensitive receptors to carbon monoxide hot-spots (Impact AQ-6) and result in other emissions (such as those leading to odors) adversely affecting a substantial number of people (Impact AQ-7).

Impact Projections in Adopted Plans

The 2016 RAQS states that air quality progress is occurring within San Diego County, but that current state and federal ozone standards are not yet attained, and continued emission reduction efforts are needed. The report states that both volatile organic compounds (VOC) and nitrogen oxides (NO_X) emissions were reduced by larger percentages between 2007 and 2014 than were projected in the 2009 RAQS Revision, and that based on regulatory actions already taken, total VOC and NO_X emissions are expected to continue decreasing through 2035 due to ongoing implementation of existing local stationary source rules, as well as state and federal mobile source regulations (SDAPCD 2016a).

The 2020 SIP addresses the requirements for attaining the 2008 and 2015 8-hour ozone (O_3) NAAQS. The 2016 SIP complies with the moderate nonattainment area classification for the planning requirements and includes demonstrations for attainment of the 2008 O_3 NAAQS by July 20, 2018 (2017 attainment year). Despite substantial air quality progress, the region did not attain the 2008 O_3 NAAQS (75 parts per billion [ppb]) by the attainment deadline; as a result, EPA reclassified San Diego County as a serious nonattainment area for that standard with a new attainment date of July 20, 2027 (2026 attainment year). Furthermore, the 2020 SIP complies with the severe nonattainment area classification planning requirements and includes demonstrations for attainment of the 2008 and 2015 O_3 NAAQS by 2026 and 2032, respectively. The 2020 SIP includes updated inventories of O_3 precursor emissions (VOC and NO_X) for the 2017 base year (the year from which future-year inventories are projected) and the 2026 and 2032 attainment years (SDAPCD 2020). The SCAQMD 2016 AQMP (SCAQMD 2016) states that the air in Southern California is far from meeting all federal and state air quality standards. However, the long-term trend of the quality shows continuous improvement and is the direct result of Southern California's comprehensive, multiyear strategy of reducing air pollution from all sources as outlined in its AQMPs. To reach federal Clean Air Act (CAA) deadlines over the next two

decades, Southern California must significantly accelerate its pollution reduction efforts. Many of the control measures proposed in the AQMP are not regulatory in form, but instead focus on incentives, outreach, and education to bring about emissions reductions through voluntary participation and behavioral changes needed to complement regulations.

The ICAPCD 8-Hour Ozone Modified AQMP includes emission inventories and also outlines control measures to address who in Imperial County controls emissions. These include the ICAPCD's stationary source control measures, regional transportation control measures, and state strategy, all of which provide the framework for ICAPCD rules that reduce ROG and NO_X emissions (ICAPCD 2010).

The U.S.-Mexico Border Environmental Program: Border 2025 includes Goal #1 to reduce air pollution. The plan encourages stakeholders to develop and implement projects that maximize health and environmental benefits from multi-pollutant emissions reductions where available, including at the San Diego/Tijuana bi-national airshed. Some examples include an improved compliance with vehicle emission standards, and establishment of vehicle inspection and maintenance programs in order to reduce emissions in the border region (EPA 2021).

The 2034 Tijuana, Tecate, and Playas de Rosarito Metropolitan Strategic Plan states that a critical issue for the Baja region is the progressive deterioration of the quality of air that is associated with the number of vehicles and no provision of sustainable transportation (IMPLAN 2013).

The California-Baja California Border Master Plan is a binational comprehensive approach to coordinate planning and delivery of projects at land POEs and transportation infrastructure serving those POEs in the California-Baja California region. The Master Plan does not have an associated environmental analysis document; however, projects included in the Master Plan could have adverse air quality impacts due to temporary construction. Nevertheless, beneficial air quality impacts would result from improved traffic conditions and reduced vehicle idle times at POEs. The plan does identify the need for a comprehensive strategy for border crossings that allows for effective integration of POEs into the municipal environment and that, in addition to the POE facility itself, complementary actions related to transportation, such as air quality, should be considered (Caltrans 2021).

Cumulative Impacts and Impact Conclusions

2025

A cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan and impact projections from adopted plans within Southern California and northern Baja California region were significant when considered together, even if not independently significant.

Many of the air quality plans note that air quality across the region has been improving due to implementation of various measures and stricter emission requirements. Nevertheless, given some uncertainty that air quality plans throughout Southern California and northern Baja would all be implemented successfully, and given that the proposed Plan's direct impacts are significant, cumulative air quality impacts would also be significant due to PM10 and SO_x emissions exceeding thresholds, the exposure of sensitive receptors to substantial PM10 concentrations, impacts associated with construction equipment emissions, and exposure of sensitive receptors to TACs.

Because cumulative air quality impacts throughout Southern California and northern Baja by 2025 would be significant, and because the proposed Plan's incremental air quality impacts are significant, the proposed Plan's incremental air quality impacts are also cumulatively considerable in 2025 (Impact C-AQ-1).

2035

As described above, cumulative air quality impacts would also be significant in 2035 due to PM10 and SO_x emissions exceeding thresholds, exposure of sensitive receptors to substantial PM10 concentrations, impacts associated with exhaust emissions from construction equipment emissions, and exposure of sensitive receptors to TACs.

Because cumulative air quality impacts throughout Southern California and northern Baja by 2035 would be significant, and because the proposed Plan's incremental air quality impacts are significant, the proposed Plan's incremental air quality impacts are also cumulatively considerable in 2035 (Impact C-AQ-1).

2050

As described above, cumulative air quality impacts would be significant in 2050 due to PM10 and SO_x emissions exceeding thresholds, exposure of sensitive receptors to substantial PM10 concentrations, impacts associated with exhaust emissions from construction equipment emissions, and exposure of sensitive receptors to TACs.

Because cumulative air quality impacts throughout Southern California and northern Baja by 2050 would be significant, and because the proposed Plan's incremental air quality impacts are significant, the proposed Plan's incremental air quality impacts are also cumulatively considerable in 2050 (Impact C-AQ-1).

Mitigation Measures

C-AQ-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO AIR QUALITY

As described in Section 4.3, the proposed Plan's significant air quality impacts would be reduced by mitigation measures **AQ-2a**, **AQ-2b**, **AQ-3a**, **AQ-3b**, **AQ-3c**, **AQ-4**, **AQ-5a**, and **AQ-5b** and would be further reduced by mitigation measures **GHG-5a**, **GHG-5b**, **GHG-5d**, **GHG-5e**, **GHG-5f**, and **TRA-2**.

Similar mitigation measures are specified in other regional plans, such as the SCAG 2020-2045 RTP/SCS EIR. However, that EIR concluded that even with implementation of mitigation measures, some direct air quality impacts would remain significant. Regional air quality planning documents provide short- and long-term strategies for reducing air pollution and control measures to be implemented by applicable jurisdictions and agencies to further reduce air pollutant emissions.

As described in Section 4.3, mitigation measures **AQ-2a** through **AQ-5b** and **GHG-5a**, **GHG-5b**, **GHG-5d**, **GHG-5e**, **GHG-5f**, and **TRA-2**, would not reduce the proposed Plan's incremental impacts to less than significant. Therefore, the proposed Plan's incremental contributions to cumulative air quality impacts in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

5.2.4 BIOLOGICAL RESOURCES

C-BIO-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON BIOLOGICAL RESOURCES

The area of geographic consideration for cumulative impacts on biological resources is the Southern California and northern Baja region. Biological resources have commonalities across the expanse of this region while also having very unique and specific characteristics in certain locations. Biological resources extend beyond jurisdictional boundaries and can be impacted by development and projects across an expansive area; thus, it is necessary to consider the entire region to adequately include broad-reaching impacts and overall loss of sensitive resources.

A hybrid approach to consideration of cumulative biological impacts allows for an overarching discussion of regional loss of biological resources associated with general patterns of regional urbanization, growth, and land use changes while also allowing for explicit consideration of individual large-scale probable future projects with impacts on specific biological resources per their environmental analysis documents.

Information on planned residential development and land use changes in Southern California is available in adopted land use plans for individual cities and counties. The plans considered and relied on for this cumulative biological analysis include the SCAG 2020-2045 RTP/SCS and its EIR (SCAG 2020); SANDAG Multiple Habitat Conservation Program (MHCP) and associated EIS/EIR (SANDAG 2003); County of San Diego Multiple Species Conservation Plan (MSCP) and associated EIR (County of San Diego 1997); San Diego County Water Authority (SDCWA) Subregional Natural Community Conversation Plan/Habitat Conservation Plan (NCCP/HCP) and associated EIR/EIS (SDCWA 2010); Western Riverside County Multi-Species Habitat Conservation Plan (MSHCP) and associated EIR/EIS (County of Riverside 2003); Coachella Valley MSHCP and associated EIR/EIS (Coachella Valley Association of Governments 2007); Strategic Plan of the Commission for Environmental Cooperation 2010-2015 (Commission for Environmental Cooperation 2010); and California-Baja 2021 California Border Master Plan (Caltrans 2021).

The cumulative impact is the combination of the impacts of the proposed Plan, probable future projects, and impact projections in adopted plans. Significant cumulative impacts related to biological resources would occur if the land use changes and transportation network improvements associated with the proposed Plan, together with adopted plans and associated infrastructure, would have a substantial adverse effect on any sensitive natural vegetation community or regulated aquatic resources; have a substantial adverse effect on any candidate, sensitive, or special-status species; interfere substantially with the movement of any native resident or migratory fish or wildlife species; or conflict with the provisions of an adopted HCP, NCCP, or other conservation plan.

Impacts of the Proposed Plan

Implementation of the proposed Plan's regional growth and land use change and transportation network improvements would result in substantial direct and indirect adverse effects on sensitive natural communities and regulated aquatic resources (Impact BIO-1); and species identified as candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS) (Impact BIO-2); and has the potential to interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites in 2025, 2035, and 2050 (Impact BIO-3). These impacts would remain significant and unavoidable even with mitigation.

The proposed Plan is designed to comply with all approved HCPs, NCCPs, other conservation plans, and local biological protection policies and ordinances. Therefore, no conflicts would occur (Impact BIO-4). Any encroachment into hardline preserve areas would not conflict with HCPs because biologically equivalent or superior compensation of habitat or project redesign would be required when there is encroachment into hardline preserve areas. Thus, the proposed Plan would result in a less-than-significant impact related to conflicts with HCPs, NCCPs, and other conservation plans in 2025, 2035, and 2050.

Impacts of Related Projects

One of the major infrastructure projects planned for development in Southern California is the California HST. The possible HST routes would affect the region of Southern California from Los Angeles to San Diego. According to the HST EIR/EIS, sufficient information is not available at the program level to conclude with certainty that mitigation will reduce impacts on affected resources to a less-than-significant level in all circumstances (HSRA 2005). Therefore, the EIR/EIS concludes that the "impacts to biological resources and wetlands are considered significant at the program level even with the application of mitigation strategies." Additional environmental assessment for individual phases of the HST project will allow more precise evaluation in the second-tier, project-level environmental analyses. The Navy OTC Revitalization and the City of San Diego Pure Water North City projects concluded there would be less-than-significant impacts related to biological resources.

Impact Projections in Adopted Plans

According to the EIR for the SCAG 2020-2045 RTP/SCS, which analyzes impacts through 2045, growth and projects would result in a wide variety of significant and unavoidable biological impacts. While site-specific analyses would be required to identify and minimize the impacts of each particular transportation and/or development project, the SCAG 2020-2045 RTP/SCS would substantially affect vegetation communities and habitat, some of which are utilized by special-status species. The EIR identified the potential to contribute to a cumulatively considerable loss of habitat and biological resources (SCAG 2020).

The MHCP is the Subregional Plan for the northwestern portion of San Diego County that encompasses 111,908 acres (29,962 acres of natural habitat) and provides conservation for 77 species in a 20,593-acre reserve. The EIS/EIR for the MHCP concluded that, because the project has the potential to cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; and reduce the number or restrict the range of an endangered, rare, or threatened species, a significant impact on some biological resources would occur (SANDAG 2003).

The San Diego County MSCP Subregional Plan is a cooperative effort by the County of San Diego and other city jurisdictions in southwestern San Diego County to implement a regional NCCP and HCP and contribute collectively to the conservation of vegetation communities and species in the MSCP study area. The associated EIR/EIR identified significant but mitigable direct and indirect impacts on biological resources (County of San Diego 1997).

The SDCWA NCCP/HCP is a comprehensive program designed to facilitate conservation and management of covered species and habitats associated with SDCWA activities and contribute to ongoing regional conservation efforts. The EIR/EIS found that implementation of the NCCP/HCP would result in less-than-significant impacts on biological resources after mitigation (SDCWA 2010).

The Western Riverside MSHCP encompasses approximately 1,966 square miles and provides for the creation of a Conservation Area that protects and manages 500,000 acres of habitat for 146 covered species. The associated EIR/EIS found significant and unavoidable impacts on sensitive upland communities as well as noncovered species; however, no cumulative biological impacts were identified as the plan would preserve sufficient acreage of the sensitive vegetation communities present in western Riverside County (County of Riverside 2003).

The Coachella Valley MSHCP protects 240,000 acres of open space and 27 species. The associated EIR/EIS found that effective implementation of the plan will help ensure that impacts on biological resources in the plan area will be less than significant (Coachella Valley Association of Governments 2007).

The Strategic Plan of the Commission for Environmental Cooperation 2010-2015 includes Strategic Objective #2, which is to increase resilience of shared ecosystems at risk. While there is no associated environmental analysis document, the intent of the plan is to develop capacity to implement an ecosystem approach to conservation and sustainable use and monitor relevant outcomes in internationally shared ecosystems, with attention to both terrestrial and marine ecosystems (Commission for Environmental Cooperation 2010).

The California-Baja California Border Master Plan is a binational comprehensive approach to coordinate planning and delivery of projects at land POEs and transportation infrastructure serving those POEs in the California-Baja California region (Caltrans 2008). The projects included in the Master Plan would have construction and operational impacts that could have an adverse effect on biological resources. No detailed analysis of biological impacts was conducted for this Master Plan.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan, the related projects, and impact projections from adopted plans within the Southern California and northern Baja region were significant when considered together, even if not independently significant. Implementation of the proposed Plan's regional growth and transportation network improvements and programs would have significant impacts related to biological resources in the San Diego region by the year 2025. By 2025, the regional growth and land use change as well as transportation network improvements would result in substantial direct and indirect adverse effects on sensitive natural communities and regulated aquatic resources; and species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. the proposed Plan would also interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites.

Some related projects such as the HST, developed in the Southern California region by 2020, or implementation of other regional plans would also have a substantial adverse effect on sensitive natural communities, regulated aquatic resources, and special-status species, or interfere substantially with the movement of wildlife, Thus, the combination of the proposed Plan and continued growth and development through the rest of the Southern California and northern Baja region would result in significant cumulative biological resource impacts.

Because cumulative biological resource impacts throughout the Southern California and northern Baja region by 2025 would be significant, and because the proposed Plan's incremental biological resource impacts are significant, the proposed Plan's incremental biological resource impacts are cumulatively considerable (Impact C-BIO-1).

The proposed Plan's impacts related to conflicts with adopted policies of HCPs and NCCPs and other local policies and ordinances protecting biological resources, in combination with similar impacts that would result in the southern California and northern Baja California region based on projections in adopted plans and other cumulative projects, would not cause a significant cumulative impact.

2035

As described in the 2025 analysis, the planned growth and projects throughout Southern California and northern Baja region and implementation of the proposed Plan resulting in regional growth and land use change and transportation network improvements would contribute to the cumulative loss of biological resources due to conversion of undeveloped lands to developed lands, including direct and indirect adverse effects on sensitive natural communities and regulated aquatic resources; and on species identified as candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the CDFW or USFWS; and has the potential to interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites.

Implementation of the proposed Plan growth and transportation network improvements and programs would have significant impacts related to biological resources in the San Diego Region by the year 2035. Land use changes and transportation network improvements associated with both the proposed Plan and regional projects and plans developed in Southern California and northern Baja by 2035 would allow for more development and redevelopment to occur, and would therefore result in substantial direct and indirect adverse effects on sensitive natural communities and regulated aquatic resources; and on species identified as candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the CDFW or USFWS. to the proposed Plan would also interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. Thus, the combination of the proposed Plan and continued growth and development through the rest of the Southern California and northern Baja region would result in significant cumulative biological resource impacts. Because cumulative biological resource impacts throughout the Southern California and northern Baja region by 2035 would be significant, and because the proposed Plan's incremental biological resource impacts are significant, the proposed Plan's incremental biological resource impacts are cumulatively considerable (Impact C-BIO-1).

Similar to the 2025 analysis, the proposed Plan's impacts related to conflicts with adopted policies of HCPs and NCCPs and other local policies and ordinances protecting biological resources, in combination with similar impacts in adopted plans and other cumulative projects, would not cause a significant cumulative impact in 2035.

2050

As described in the 2025 analysis, the planned growth and projects throughout Southern California and northern Baja region and implementation of the proposed Plan resulting in regional growth and land use change and transportation network improvements would contribute to the cumulative loss of biological resources as result of conversion of undeveloped lands to developed lands, including substantial direct and indirect adverse effects on sensitive natural communities and regulated aquatic resources; and on species identified as candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the CDFW or USFWS; and has the potential to interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites.

Implementation of the proposed Plan growth and transportation network improvements and programs would have significant impacts related to biological resources in the San Diego Region by the year 2050. Land use changes and transportation network improvements associated with both the proposed Plan as well as regional projects and plans developed in Southern California and northern Baja by 2050 would allow for more development and redevelopment to occur, and would therefore result in substantial direct and indirect adverse effects on sensitive natural communities and regulated aquatic resources; and species identified as candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the CDFW or USFWS. The proposed Plan would also interfere substantially with fish and wildlife movement, wildlife corridors, and nursery sites. Thus, the combination of the proposed Plan and continued growth and development through the rest of the Southern California and northern Baja region would result significant cumulative biological resource impacts.

Because cumulative biological resource impacts throughout the Southern California and northern Baja region by 2050 would be significant, and because the proposed Plan's incremental biological resource impacts are significant, the proposed Plan's incremental biological resource impacts are cumulatively considerable (Impact C-BIO-1).

Similar to the 2025 analysis, the proposed Plan's impacts related to conflicts with adopted policies of HCPs and NCCPs and other local policies and ordinances protecting biological resources, in combination with similar impacts in adopted plans and other cumulative projects, would not cause a significant cumulative impact in 2050.

Mitigation Measures

C-BIO-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON BIOLOGICAL RESOURCES

Implementation of mitigation measures **BIO-1a** through **BIO-1e**, **BIO-2a** through **BIO-2c**, and **BIO-3** would reduce direct and indirect impacts of the proposed Plan. Measures **BIO-1a** through **BIO-1e** include design and avoidance measures to be incorporated into projects to avoid impacts on sensitive natural vegetation communities and aquatic resources; provide compensatory mitigation when impacts are unavoidable; implement mitigation and monitoring plans per agency requirements; prepare habitat restorations plans; prepare habitat/long-term management plans; and implement BMPs to avoid indirect impacts. Measures **BIO-2a**, through **BIO-2c** include design and avoidance measures to be incorporated into projects to avoid and reduce impacts on special-status wildlife and plant species and provide compensatory mitigation. Measure **BIO-3** includes measures to provide for movement of wildlife. Some impacts on sensitive natural communities and regulated aquatic resources; species identified as candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the CDFW or USFWS; and interference with wildlife movement and wildlife corridors remain significant and unavoidable after implementation of all applicable mitigation measures.

Similar types of mitigation measures are provided in other regional plans, such as the SCAG 2020-2045 RTP/SCS EIR, and individual projects have project-specific biological mitigation. The SCAG 2020-2045 RTP/SCS EIR concluded that even with implementation of mitigation, biological resource impacts would remain significant. The HST EIR/EIS provided biological mitigation strategies, but concluded that it could not be determined that all biological impacts would be fully mitigated to below a level of significance. Thus, there is no assurance that the proposed mitigation would reduce impacts of related projects in Southern California and northern Baja to a less-than-significant level.

Mitigation measures **BIO-1a** through **BIO-3** would not reduce the proposed Plan's incremental impacts to less than significant. Therefore, the proposed Plan's incremental contributions to cumulative biological impacts in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

5.2.5 CULTURAL RESOURCES

C-CULT-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON CULTURAL RESOURCES

The area of geographic consideration for cumulative impacts on cultural resources is the Southern California and northern Baja California region. Because local and regional settlement patterns are closely linked, it is important to evaluate the loss of cultural resources across this entire geographic area to adequately consider how the loss of resources would impact the understanding of the closely interrelated prehistory and history of the peoples who have inhabited the Plan Area. Historical resources should be considered based on their importance both within their local setting and in the regional framework. A projection approach for cumulative analysis of cultural resources allows for an overarching discussion of regional loss of interrelated cultural resources associated with general patterns of regional urbanization, growth, and land use changes. The cumulative impact is the combination of the impacts of the proposed Plan and impact projections in adopted planning documents. Significant cumulative impacts related to cultural resources would occur if cumulatively there would be a substantial increase in impacts with regard to the significance of historic or unique archaeological resource, or disturbance of human remains.

This cumulative impact assessment considers and relies on the impact analysis within this EIR for the proposed Plan, SCAG's Connect SoCal (2020-2045 RTP/SCS EIR (SCAG 2020) for the Southern California region, the County of San Diego General Plan Update EIR (County of San Diego 2011), and the California-Baja California 2021 Border Master Plan (Caltrans 2021). Many local jurisdictions provide guidance and protective measures for cultural resources in their general plans and other local planning documents. There are generally no regional plans pertaining to such resources for the northern Baja California region. The California-Baja California Border Master Plan is a binational comprehensive approach to coordinate planning and delivery of projects at land POEs and transportation infrastructure serving those POEs in the California-Baja California region. The Master Plan does not have an associated environmental analysis document, and no detailed analysis of cultural resource impacts was conducted for this Master Plan (Caltrans 2021).

Impacts of the Proposed Plan

Areas in the San Diego region are known to have a high potential for prehistoric, historic, and cultural resources. Implementation of the proposed Plan would result in the construction of development projects and transportation network improvements that would result in a wide range of construction and ground-disturbing activities, such as excavation, grading, and clearing, which remove and/or disturb the upper layer of soils. As cultural resources have been found within inches of the ground surface in some areas of the San Diego region, in some locations these ground-disturbing activities would cause a substantial adverse change in the significance of a historical or unique archeological resource (Impact CULT-1). Implementation of the proposed Plan would necessitate construction activities that in some locations would cause a substantial adverse change in the significance of a historical or unique archeological resource through the physical demolition, destruction, relocation, or alteration of a resource or its immediate surroundings such that the significance of a historical or unique archeological resource would be materially impaired. This would occur within each horizon year analyzed (2025, 2035, and 2050). Therefore, impacts related to a substantial adverse change in the significance of a historical or unique archeological resource would be significant.

As described in Section 4.5, the proposed Plan would result in ground-disturbing activities associated with regional growth and land use change and planned transportation network improvements that in some locations would unearth and impact buried human remains in 2025, 2035, and 2050. Impacts would be less than significant because adherence to existing laws and regulations associated with the disturbance of human remains as detailed in Section 4.5 ensures the appropriate handling of any human remains that are encountered (CULT-2).

Impact of Related Projects

Projects planned in the Southern California region, such as the Navy OTC Revitalization Project, SDIA Airport Development Plan, HST, City of San Diego Pure Water North City, would result in impacts related to destruction or alteration of historical resources. Other land development and infrastructure projects throughout the region and state, such as transportation infrastructure, energy generation and transmission corridors, and commercial and residential land development would also result in impacts if these projects occur in areas containing significant cultural resources.

For example, the HST project in the San Diego region would result in construction of track, bridges and elevated guideways, stations, and other features that may result in destruction or alteration of cultural resources (HSRA 2005). The EIR/EIS prepared for the HST project determined that the project would result in significant cumulative impacts on cultural resources. The EIR for the SDIA Airport Development Plan also identified significant and unavoidable impacts to historical resources (SDCRAA 2019). Both the Navy Old Town Campus Revitalization and City of San Diego Pure Water North City Project would result in impacts, however, impacts associated with historical resources would be significant and mitigated to a level of less than significant respectively. Impacts would similarly be cumulatively considerable, if these projects occur in close proximity to one another.

Impact Projections in Adopted Plans

Implementation of SCAG's 2020-2045 RTP/SCS would result in significant and unavoidable impacts related to adverse changes in the significance of archaeological and historic built environment resources and potentially disturb human remains. In addition, the 2020-2045 RTP/SCS's influence on growth would contribute to regionally significant impacts on cultural resources and be cumulatively considerable (SCAG 2020). The EIR prepared for the County of San Diego General Plan Update found that, with mitigation, implementation of the updated General Plan would result in less-than-significant direct or cumulative impacts on historical, archaeological, or disturbance of human remains. The California-Baja California Border Master Plan does not provide analysis of impacts on cultural resources; however, projects included in the Master Plan could have adverse impacts on cultural resources due to ground disturbance necessary for construction of infrastructure

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in year 2025 would result if the combined impacts of the proposed Plan, impacts of related projects, and impact projections from adopted plans within the Southern California and northern Baja region are significant when considered together, even if not independently significant. As described above, implementation of the proposed Plan, related projects, and other adopted plans would result in ground-disturbing activities that would cause a substantial adverse change in the significance of a historical or unique archeological resource. California projects are required to adhere to federal, state and local

regulations, as described in Section 4.5; however, cumulative growth development located in Mexico would not be subject to compliance with such regulations. Additionally, even with regulations in place, individual historical or unique archeological resources could still be impacted or degraded from demolition, destruction, alteration, or structural relocation as a result of new private or public development or redevelopment allowable under the proposed plan or other adopted regional plans. Therefore, cumulative impacts on historical and unique archeological resources would be significant. Because the proposed Plan's impacts on historical and unique archeological resources are significant, they are also cumulatively considerable in 2025. In addition, implementation of the proposed Plan combined with development associated with other regional plans and related projects would result in adverse impacts on human remains from development activities. Development associated with the proposed Plan as well as in the SCAG region would be required to comply with federal, state, and local regulations, as described in Section 4.5, if human remains are encountered. Cumulative projects located in Mexico would not be subject to compliance with such regulations. However, the proposed Plan's contribution to these impacts would be less than cumulatively considerable, because required compliance with federal, state, and local regulations would ensure the appropriate handling of any human remains that are encountered (Impact C-CULT-1).

2035

The cumulative analysis presented above for year 2025 would be applicable to year 2035, and significant cumulative impacts on cultural resources would occur. By 2035, increases in regional growth and land use change, and the number of transportation network improvements implemented over those that occurred by 2025 would result in additional adverse impacts related to changes in the significance of a historical or unique archeological resource. As described in the 2025 analysis, cumulative impacts on historical and unique archeological resources would be significant because there would be cumulative adverse changes in the significance of those resources due to the proposed Plan, other regional plans, and development located in northern Baja California. Because cumulative cultural resource impacts throughout the Southern California and northern Baja region by 2035 would be significant, and because the proposed Plan's incremental impacts are significant, the proposed Plan's incremental cultural resource impacts are also cumulatively considerable (Impact C-CULT-1).

2050

The cumulative analysis presented above for years 2025 and 2035 would be applicable to year 2050, and significant cumulative impacts on cultural resources would occur. By 2050, increases in regional growth and land use change, and the number of transportation network improvements implemented over those that occurred by 2025 and 2035, would result in adverse impacts related to changes in the significance of a historical or unique archeological resource.

As described in the 2025 analysis, cumulative impacts on historical or unique archeological resources would be significant because there would be cumulative adverse changes in the significance of those resources due to the proposed Plan, other regional plans, and development located in northern Baja California. Because the proposed Plan's impacts on cultural resources are significant, they are also cumulatively considerable in 2050 (Impact C-CULT-1).

Mitigation Measures

C-CULT-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON CULTURAL RESOURCES.

Mitigation measures **CULT-1a** and **CULT-1b** call for measures to avoid or substantially reduce adverse changes in the significance of a cultural resource, and protect cultural resources listed on or eligible for listing on the California Register of Historical Resources (CRHR). These measures also require the implementation of monitoring and data recovery programs during construction. The mitigation measures would be included in project-level planning, design, and CEQA reviews. However, their implementation would not reduce impacts to less than significant because it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level.

Because mitigation measures **CULT-1a** and **CULT-1b** would not reduce the proposed Plan's incremental impacts to less than significant, the proposed Plan's incremental contributions to cumulative cultural resources impacts in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

5.2.6 ENERGY

C-EN-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON ENERGY

The area of geographic consideration for cumulative energy impacts is the Southern California and northern Baja region. The demand for energy is a common theme throughout the region. Land use change and the transportation system would influence the demand for future energy development or the location and need for new or additional energy infrastructure across the Southern California and northern Baja region. The provision of energy can be linked to jurisdictions, but often service providers and their infrastructure cover large areas. Thus, it is necessary to consider the Southern California and northern Baja region as a whole and the overall amount of development that would generate additional pressure and demand on energy use and generation facilities.

A hybrid approach to the cumulative energy analysis allows for an overarching discussion of regional impacts associated with general patterns of regional urbanization, growth, and land use changes that would create new or additional energy use, modify demand for the provision of energy, or dictate where new or expanded energy infrastructure is located. Discussion of specific projects also allows for consideration of individual large-scale existing and probable future projects with known impacts on energy resources.

Growth, land use change, and transportation system improvements occurring throughout the Southern California and northern Baja region would impact energy demand, development, and supply. Cumulative energy impacts would result if there were an increase in overall per capita energy consumption or inefficient, wasteful, or unnecessary energy use; or obstruction of state and local renewable energy and energy efficiency plans, regulations, and policies.

Documents considered in the cumulative energy analysis include the California Energy Commission's (CEC) California Energy Demand 2018-2030 Revised Forecast (CEC 2018), County of San Diego Strategic Energy Plan 2015-2020 (County of San Diego 2015), and San Diego Gas & Electric Company 2012 Long-Term Procurement Plan (SDG&E 2012).

Impacts of the Proposed Plan

As detailed in Section 4.6, total energy use and per capita energy use in 2025, 2035, and 2050 would be less than total energy use and per capita energy use in 2016. Therefore, the proposed Plan would not result in an increase in overall per capita energy consumption or otherwise use energy in an inefficient, wasteful, or unnecessary manner in 2025, 2035, or 2050, and the impact would be less than significant (Impact EN-1).

The county and various cities within the SANDAG region, in accordance with state law, will require the implementation of a variety of energy efficiency and renewable energy measures to decrease fossil fuel energy consumption as a means to reduce GHG emissions. As detailed in Section 4.6, the proposed Plan would comply with the state's programs and local plans and policies aimed at reducing energy consumption and promoting renewable energy. Thus, this impact would be less than significant in 2025, 2035, and 2050 (Impact EN-2).

Impacts of Related Projects

Multiple energy projects in various stages of planning, permitting, and construction are ongoing in the Southern California and northern Baja region. Some of these include the Crimson Solar Project in Blythe, California; Palen-Nalep Solar, Victory Pass Solar, and Rice Solar energy projects in Riverside County; Carlsbad NRG and Pio Pico Energy Center in San Diego County; Clean Hydrogen Energy and Comino Solar project in Kern County; and Black Rock 5 & 6 Geothermal Power Project in Imperial County. All energy projects requiring CEC approval or licensing must go through the CEC permitting process, which is a certified regulatory program under CEQA. The CEC license/certification subsumes all requirements of state, local, or regional agencies otherwise required before new infrastructure is constructed.

The HST environmental document states that, while the project would have a potentially significant effect related to long-term electric power consumption when viewed on a system-wide basis, it represents a more energy-efficient mode of transportation than travel by aircraft or car, such that the HST system would result in an overall reduction in total energy consumption. The EIR/EIS states that the HST system would reduce energy consumption overall and any localized energy impacts would be avoided through proper planning and design of power distribution systems and their relationship with the overall power grid (HSRA 2005).

Energy impacts were found to be less than significant for the City of San Diego Pure Water North City Project (City of San Diego 2018), and were not addressed in the Navy OTC Revitalization Draft EIS (Navy 2021).

Impact Projections in Adopted Plans

The SCAG 2020-2045 RTP/SCS EIR identified that implementation of the RTP/SCS would contribute to a cumulatively considerable increase in non-renewable energy use that would be significant and unavoidable. The EIR also found that the plan would result in a significant and unavoidable impact related to the use of electricity, natural gas, gasoline, diesel, and other non-renewable energy types in the construction and expansion of the regional transportation system and forecasted development (SCAG 2020).

The CEC California Energy Demand 2018-2030 Revised Forecast report updates 10-year forecasts for electricity and end-user natural gas in California and for major utility planning areas within the state. The forecast includes estimates of additional achievable energy efficiency, electricity consumption, peak demand, and natural gas consumption savings. While there is no associated environmental analysis, the forecast does show the continued increase in demand for energy supplies in the state over the next 10 years (CEC 2018).

The County of San Diego Strategic Energy Plan provides high-level energy and sustainability objectives and goals in the areas of energy and water conservation and efficiency, promotion of renewable energy; reduction in demand for fossil fuel consumption and addressing vehicle emissions and VMTs, energy and sustainability education and outreach; regional collaboration; and climate action planning. The main priorities for the plan period are to control utility costs, accelerate distributed generation employment, facilitate alternative fuel vehicle deployment, reduce the region's carbon footprint, expand choice for consumer energy supply, and increase the use of information technology to help reach objectives and inform the public (County of San Diego 2015).

SDG&E is a major provider of energy for the San Diego region. The objective of SDG&E's 2012 Long-Term Procurement Plan is to provide reliable electric supply to customers at the lowest cost, while also meeting the state's preferred loading order for resources and reducing greenhouse gas (GHG) emissions. The long-term plan (10 years) addresses both demand- and supply-side resources and makes recommendations to achieve the appropriate balance between each of these resource types. The plan adds resources in the order of the state's priorities as follows: energy efficiency; demand response; renewable power; distributed generation; and clean and efficient fossil-fired generation (SDG&E 2012).

Cumulative Impacts and Impact Conclusions

2025

The proposed Plan would not result in an increase in overall per capita energy consumption or otherwise use energy in an inefficient, wasteful, or unnecessary manner in 2025. Additionally, the proposed Plan would result in a decrease of total and per capita energy use, including a decrease in fossil fuel energy. In addition, regional growth and land use change and transportation network improvements and programs would not conflict with or obstruct a state or regional plan related to the increased use of renewable energy or energy efficiency in 2025. Because the proposed Plan does not make an incremental contribution to these cumulative energy impacts, cumulative energy impacts would not be significant, and the proposed Plan would not result in cumulatively considerable impacts in 2025. Impacts would be less than significant.

2035

The proposed Plan would not result in an increase in overall per capita energy consumption or otherwise use energy in an inefficient, wasteful, or unnecessary manner in 2035. Additionally, the proposed Plan would result in a decrease of total and per capita energy use, including a decrease in fossil fuel energy. In addition, regional growth and land use change and transportation network improvements and programs would not conflict with or obstruct a state or regional plan related to the increased use of renewable energy or energy efficiency in 2035. Because the proposed Plan does not make an incremental contribution to these cumulative energy impacts, cumulative energy impacts would not be significant, and the proposed Plan would not result in cumulatively considerable impacts in 2035. Impacts would be less than significant.

2050

The proposed Plan would not result in an increase in overall per capita energy consumption or otherwise use energy in an inefficient, wasteful, or unnecessary manner in 2050 because the proposed Plan would result in a decrease of total and per capita energy use, including a decrease in fossil fuel energy. In addition, regional growth and land use change and transportation network improvements and programs would not conflict with or obstruct a state or regional plan related to the increased use of renewable energy or energy efficiency in

2050. Because the proposed Plan does not make an incremental contribution to these cumulative energy impacts, cumulative energy impacts would not be significant, and the proposed Plan would not result in cumulatively considerable impacts in 2050. Impacts would be less than significant.

Mitigation Measures

No mitigation is required.

5.2.7 GEOLOGY, SOILS, AND PALEONTOLOGICAL RESOURCES

C-GEO-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON GEOLOGICAL AND SOIL RESOURCES

C-PALEO-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON PALEONTOLOGICAL RESOURCES

The area of geographic consideration for cumulative impacts is the Southern California and northern Baja region. While some geology and soil features can be very distinct to certain locations, geologic features can also have broad-reaching elements, such as faults and underlying bedrock formations. Geology, soils, and paleontological resources are not confined by jurisdictional boundaries. Thus, it is necessary to consider geologic resources, soils, and paleontological resources in Southern California and northern Baja as a whole region.

A projection approach for cumulative analysis of geologic, soils, and paleontological resources allows for an overarching discussion of regional and cross-border risks of seismic and geologic hazards, soil erosion or loss, and destruction of unique paleontological resources or unique geologic features associated with general patterns of regional urbanization, growth, and land use changes. The cumulative impact is the combination of the impacts of the proposed Plan and impacts on geology, soils, and paleontological resources resulting from implementation of approved regional planning documents. Significant cumulative impacts would occur if there were cumulative risks of exposure of people or structures to substantial seismic or geologic hazards, development on unstable geologic units, soil loss or erosion, or destruction of unique paleontological resources or unique geologic features in Southern California and northern Baja. (Impacts related to development in areas with unsuitable soils for septic tanks or alternative wastewater disposal systems are localized in nature, and thus are not considered further in this cumulative impact analysis.)

This cumulative impact assessment considers and relies on the impact analysis within this EIR for the proposed Plan, SCAG's 2020-2045 RTP/SCS EIR (SCAG 2020) for the Southern California region, the County of San Diego General Plan Update EIR (County of San Diego 2011), and the California-Baja California Border Master Plan (Caltrans 2021). There are generally no regional plans pertaining to such resources for the northern Baja California region.

Impacts of the Proposed Plan

Regional growth and land use change and the transportation network improvements included as part of the proposed Project would expose additional people and structures to seismic hazards such as strong seismic ground shaking, fault rupture, liquefaction, and earthquake-induced landslides as some development would occur in hazard areas within the San Diego region.

Future land development and transportation network improvements also would place structures at risk to impacts caused by unstable soils, including expansive, collapsible, or unstable soils; landslides; and erosion or loss of topsoil. Existing regulations discussed in Section 4.7 would ensure that these impacts would not be significant in 2025, 2035, and 2050. Compliance with regulatory requirements and implementation of required design measures would ensure that regional growth and land use change as well as transportation network improvements and programs associated with the proposed Plan would not cause substantial soil erosion or the loss of topsoil, and the impact would be less than significant in 2025, 2035, and 2050 (Impact GEO-1 through GEO-4).

Areas throughout the region have distinct geologic rock formations with known paleontological sensitivity and areas with unique geologic features. Ground-disturbing activities, such as construction associated with development, redevelopment, and transportation network improvements, in some locations would directly or indirectly destroy a unique paleontological resource or site or unique geological feature. Existing federal, state, and local laws, regulations, and programs included in Section 4.7 would help reduce impacts on paleontological resources and unique geological resources, but there is no assurance that they would keep impacts from being significant. Therefore, impacts on paleontological resources and unique geologic features would be significant in 2025, 2035, and 2050 (Impact PALEO-1).

Impacts of Related Projects

Projects planned in the Southern California region, such as the Navy OTC Revitalization Project, SDIA Airport Development Plan, HST, and City of San Diego Pure Water North City, would involve ground-disturbing activities that could result in impacts related to destruction or alteration of paleontological resources. Other land development and infrastructure projects throughout the region, such as transportation infrastructure, energy generation and transmission corridors, and commercial and residential land development would also result in impacts if these projects occur in areas containing significant paleontological resources.

For example, the HST project in the San Diego region would result in construction of track, bridges and elevated guideways, stations, and other features that may result in destruction or alteration of paleontological resources (HSRA 2005). The EIR/EIS prepared for the HST project determined that the project would result in significant cumulative impacts on paleontological resources. The EIR for the SDIA Airport Development Plan did not identify significant impacts to paleontological resources (SDCRAA 2019). The Navy Old Town Campus Revitalization Project would also not result in impacts to paleontological resources (U.S. Department of the Navy 2021). Impacts would similarly be cumulatively considerable, if these projects occur in close proximity to one another. The City of San Diego Pure Water North City Project concluded that impacts on paleontological resources would be less than significant with the implementation of mitigation measures (City of San Diego 2018).

Impact Projections in Adopted Plans

The EIR prepared for the SCAG 2020-2045 SCS/RTP EIR analyzed impacts on the SCAG region up to 2045 and identified significant and unavoidable impacts related to implementation of that plan due to substantial soil erosion and loss of topsoil and the destruction of a unique paleontological resource or site or unique geologic feature. The EIR also found that the 2020-2045 SCAG RTP/SCS would contribute to a cumulatively considerable impact related to the damage or destruction of paleontological resources (SCAG 2020). The EIR prepared for the County of San Diego General Plan Update found that implementation of the updated General Plan would not result in potentially significant direct or cumulative impacts associated with the exposure to seismic-related hazards, soil erosion or topsoil loss, soil stability, expansive soils, or waste water disposal systems; and

with mitigation, the General Plan Update would result in less-than-significant direct or cumulative impacts on paleontological resources (County of San Diego 2011).

Adopted land use plans for local jurisdictions in Southern California and northern Baja would support the construction of new development and redevelopment through policy changes, general plan updates, and zoning amendments that encourage and facilitate population growth and land use changes. Due to the seismically active nature of the Southern California and northern Baja region, these development projects would subject additional people and structures to ground shaking, fault rupture, liquefaction, and earthquake-induced landslides. Projects would also be susceptible to impacts caused by unstable soils, including expansive, collapsible, or unstable soils; and landsliding. The severity of these impacts would be determined by geographic location, soil type, and construction requirements such as grading and excavation. Development associated with the implementation of regional planning documents in California would be required to adhere to the design standards described in the California Building Code (CBC) and the Uniform Building Code (UBC), which regulate the design and construction of buildings and structures and effectively reduce the effects of seismic activity and geologic hazards at the project level, as described in Section 4.7.

The California-Baja California Border Master Plan does not provide analysis of impacts on paleontological resources; however, projects included in the Master Plan could have adverse impacts on paleontological resources due to ground disturbance necessary for construction of infrastructure.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combination of impacts of the proposed Plan and impact projections from adopted plans within the Southern California and northern Baja region, and related projects, were significant when considered together, even if not independently significant. As described above, implementation of the regional growth and land use changes and transportation network improvements associated with the proposed Plan would expose additional people and structures to seismic hazards such as ground shaking, fault rupture, liquefaction, and earthquake-induced landslides as development occurs in hazard areas within the San Diego region. Future development would also place structures at risk to impacts caused by unstable soils, including expansive, collapsible, or unstable soils; landsliding; and erosion or loss of topsoil. Some development would occur in areas with soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems. Whether from the proposed Plan or from development associated with other approved plans, such as the SCAG 2020-2045 RTP, or from related projects, impacts would generally be confined to a specific project area, rather than result in an aggregated cumulative effect over the Southern California and northern Baja California region. All California development and infrastructure projects would be required to adhere to the design standards described in the CBC and the UBC, which regulate the design and construction of buildings and structures and substantially reduce the effects of seismic activity and other geologic hazards at the project level, as described in Section 4.7. Therefore, cumulative impacts related to geologic and seismic hazards or unstable soils would not be significant, and the proposed Plan would not result in cumulatively considerable impacts related to geologic and seismic hazards or unstable soils.

Implementation of the proposed Plan combined with other regional plans, related projects, and development in northern Baja California would result in a significant cumulative impact associated with paleontological resources and unique geological features from extensive grading, excavation, or other ground-disturbing activities. Development would be regulated by state and local laws and regulations, including CEQA and local jurisdictions' grading ordinances. However, cumulative growth and development located in Mexico would not

be subject to compliance with such regulations. Additionally, the loss of paleontological resources or unique geological features on a regional level would not be adequately avoided or reduced through methods specified in these regulations. Based on the above analysis, cumulative impacts on paleontological resources and unique geological features would be significant. Because cumulative paleontological resource impacts throughout the Southern California and northern Baja region by 2020 would be significant, and because the proposed Plan's incremental impacts are significant, the proposed Plan's incremental paleontological resource and unique geological feature impacts are cumulatively considerable (Impact C-PALEO-1).

2035

By 2035, transportation and development projects associated with the proposed Plan and other development in Southern California and northern Baja would expose additional people and structures to geologic and seismic hazards such as ground shaking, fault rupture, liquefaction, and earthquake-induced landslides, and would also place structures at risk to impacts caused by unstable soils, including expansive, collapsible, or unstable soils, and landsliding. All California development and infrastructure projects would be required to adhere to the design standards described in the CBC and the UBC, which regulate the design and construction of buildings and structures and substantially reduce the effects of seismic activity and other geologic hazards at the project level, as described in Section 4.7. Therefore, cumulative impacts related to geologic and seismic hazards or unstable soils would not be significant, and the proposed Plan would not result in cumulatively considerable impacts related to geologic and seismic hazards or unstable soils.

As described in the 2025 analysis, cumulative impacts on paleontological resources and unique geological features would be significant because there would be cumulative adverse changes in the significance of those resources due to the proposed Plan, other regional plans, and development located in northern Baja California (Impact C-PALEO-1).

2050

By 2050, transportation and development projects associated with the proposed Plan and other development in Southern California and northern Baja would expose additional people and structures to geologic and seismic hazards such as ground shaking, fault rupture, liquefaction, and earthquake-induced landslides, and would also place structures at risk to impacts caused by unstable soils, including expansive, collapsible, or unstable soils, and landsliding. Although the 2050 time period is beyond implementation of the planning horizons of regional planning documents other than the proposed Plan, such as most adopted land use plans, this analysis would apply to future projects in the Southern California and northern Baja region. All California development and infrastructure projects would be required to adhere to the design standards described in the CBC and the UBC, which regulate the design and construction buildings and structures and substantially reduce the effects of seismic activity and other geologic hazards at the project level, as described in Section 4.7. Therefore, cumulative impacts related to geologic and seismic hazards or unstable soils would not be significant, and the proposed Plan would not result in cumulatively considerable impacts related to geologic and seismic hazards or unstable soils.

As described in the 2020 analysis, cumulative impacts on paleontological resources and unique geological features would be significant because there would be cumulative adverse changes in the significance of those resources due to the proposed Plan, future projects, and development located in northern Baja California. Because the proposed Plan's impacts on paleontological resources and unique geological features are significant, they are also cumulatively considerable in 2050 (Impact C-PALEO-1).

Mitigation Measures

C-PALEO-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS ON PALEONTOLOGICAL RESOURCES

Mitigation measure **PALEO-1a** calls for project implementation agencies to assess impacts on unique paleontological resources or unique geological features prior to construction of individual projects associated with the proposed Plan. If a project is determined to be located within an area likely to contain unique paleontological resource sensitivity or unique geologic features, implementation of mitigation measure **PALEO-1b** calls for avoidance where feasible or provide a qualified paleontologist to be stationed on site of any future development to monitor construction; identify valuable paleontological specimens, if any; and recover and report on any significant resources found at the site.

Implementation of mitigation measures **PALEO-1a** and **PALEO-1b** would protect these unique resources through the presence of a certified paleontologist and compliance with existing regulations; however, it cannot be guaranteed that these measures will reduce impacts to a less-than-significant level for all projects. Therefore, the proposed Plan's incremental contributions to cumulative paleontological and unique geologic feature impacts in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

5.2.8 GREENHOUSE GAS EMISSIONS

C-GHG-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO GHG EMISSIONS

Climate change is a global problem and greenhouse gases (GHGs) persist in the atmosphere for long enough time periods to be dispersed around the globe. Thus, the area of geographic consideration for cumulative impacts of GHG emissions is global. Atmospheric concentrations of GHGs have been increasing since measurements began in the 1970s. As of 2020, the globally averaged annual mean concentration of atmospheric carbon dioxide (CO2) is approximately 413 parts per million (ppm), methane (CH4) is approximately 1,891 parts per billion (ppb), and nitrous oxides (N2O) is approximately 333 ppb (NOAA 2021a, 2021b, and 2021c).

The projection approach to GHG considers both forecasted GHG emissions on a global scale, as well as a state and local-level analysis of GHGs. In the SANDAG region, the transportation sector is the largest contributor of GHG emissions. Thus, this analysis takes into consideration the cumulative GHG impacts resulting from the overall future transportation improvements, future increases in population, and planned regional development tied to the proposed Plan.

From the standpoint of CEQA, GHG impacts to climate change are inherently cumulative on a Statewide level. Significant cumulative impacts would occur if the proposed Plan were to directly or indirectly result in an increase in GHG emissions compared to existing project conditions; conflict with SB 375 GHG emission reduction targets for 2035, SANDAG Board of Directors Resolution No. 2021-17, Local Climate Action Plans, or; or be inconsistent with the State's ability to achieve the 2030 reduction target of SB 32 and long-term reduction goals of Executive Orders S-3-05 and B-55-18.

This cumulative impact assessment considers and relies on the impact analysis within this EIR for the proposed Plan, the 2016 GHG Inventory and Projections for the San Diego Region (SANDAG 2016), SB 375, the SANDAG Board of Directors Resolution No. 2021-2017, and the California Air Resources Board 2017 Scoping Plan Update (CARB 2017).

Impacts of the Proposed Plan

The proposed Plan's regional growth and land use change and transportation network improvements would create additional sources of GHG emissions. The proposed Plan supports sustainable growth through creating a compact development pattern with growth focused in existing urban areas where transit and infrastructure are already in place. Locating people and jobs near each other and near transit encourages use of transit, carpooling, and active transportation options, thereby reducing transportation related GHG emissions. Also, the proposed Plan encourages GHG emissions reductions through alternative transit improvements including pedestrian network improvements, safe routes to schools strategies, bicycle network facilities, vanpools, carpools, and buspools. GHG emissions in 2025, 2035, and 2050 would be lower than in 2016. Because the proposed Plan would not directly or indirectly result in an increase in GHG emissions compared to existing conditions, this is a less than significant impact in all forecasted years (Impact GHG-1).

The proposed Plan would not conflict with SB 375 emission reduction targets for 2035 or the SANDAG Board of Directors Resolution No. 2021-17 emissions reduction target because it would result in reductions of per capita CO2 emissions that exceed those targets. In addition, implementation of regional growth and land use change and transportation network improvements and programs under the proposed Plan would not conflict with or impede the implementation of adopted CAPs, GHG reduction plans, and/or sustainability plans for the years 2025, 2035, and 2050 (Impact GHG-2 through GHG-4).

However, because the total emissions in the San Diego region in 2030 would exceed the 2030 regional GHG reduction reference point of 15.6 million metric tons of carbon dioxide equivalent (MMTCO2e), which is based on the SB 32 targets for 2030 and the 2017 Scoping Plan, the proposed Plan's GHG emissions would be inconsistent with state's ability to achieve the goals of SB 32 and these impacts would be significant in 2030. In addition, because total regional GHG emissions in 2045 and 2050 would exceed the 2045 and 2050 reference points of net zero and 5.2 $MMTCO_2e$, respectively (based on the goals of EO B-55-18 and S-3-05), the proposed Plan's 2045 and 2050 GHG emissions would be inconsistent with the State's ability to achieve the goals of EO B-55-18 and S-3-05. Therefore, this impact would be significant in 2030, 2045, and 2050 (Impact AQ-5).

Impact Projections in Adopted Plans

As stated in the Climate Change 2014 Synthesis Report published by the United Nation's Intergovernmental Panel on Climate Change (IPCC), human influence on the climate system is clear, and recent anthropogenic emissions of GHGs are the highest in history. Recent climate changes have had widespread impacts on human and natural systems and that cumulative emissions of CO2 will largely determine global mean surface warming by the late 21st century and beyond.

Scaling back from a global overview, Section 4.8 outlines a large number of federal, state, and local laws, regulations, and policies that are aimed at reducing GHG emissions through a variety of means. On the federal level, GHG reduction is mandated through energy policies, the CAFE program, CAA, and a series of executive orders.

In 2019, emissions from GHG emitting activities statewide were 418.2 MMTCO2e, 7.2 MMTCO2e lower than 2018 levels and almost 13 MMTCO2e below the 2020 GHG Limit of 431 MMTCO2e (CARB 2021). The State of California has a considerable policy and regulation regimen related to GHG reduction, including SB 32 and associated 2017 Climate Change Scoping Plan. The 2017 Climate Change Scoping Plan identifies measures for how California can achieve the 2030 target set forth in SB 32, and substantially advance toward the 2050 reduction goal identified in EO-S-3-05. The 2017 Scoping Plan integrates several existing CARB regulations and

State strategies, including the Cap-and-Trade Program, Low Carbon Fuel Standard (LCFS), SB 350 goals for renewable electricity procurement and doubling of Statewide energy efficiency savings in electricity and natural gas end uses, Mobile Source Strategy, Sustainable Freight Action Plan, and the Short-Lived Climate Pollutant (SLCP) Strategy. The 2017 Scoping Plan accelerates the State's focus on moving freight with zero and near-zero technologies, investing in renewables, using low-carbon fuels including electricity and hydrogen, reducing emissions of short-lived climate pollutants (e.g., CH_4, black carbon, and fluorinated gases), creating walkable communities with expanded mass transit and other alternatives to traveling by car, continuing the cap-and-trade program, and managing natural lands to become carbon sinks (CARB 2017). Locally, GHG emissions projections and reduction are addressed in various plans and policies, including local jurisdictions' individual Climate Action Plans. However, while the State is currently on target for achieving GHG emission reductions compared to existing conditions, there are currently no statewide plans for achieving state GHG emissions reduction goals beyond 2030, and future Statewide cumulative GHG emissions are highly variable and unknown; thus, cumulative impacts related to GHG emissions are potentially significant.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan and impact projections from adopted plans were significant when considered together, even if not independently significant. GHG emissions and impacts to global climate change are inherently cumulative as the quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, a single project would be unlikely to measurably contribute to a noticeable incremental change in the global average temperature. As described above, a wide variety of plans and regulations at all levels of government, including global, federal, state, and local, provide for regulation and reduction of GHG emissions. However, there is uncertainty about the ability of the nation and world to meet GHG reduction goals. Many of the proposed strategies and mitigation proposed in GHG reduction plans and policies are based on new and developing technology and can be highly dependent upon the global economy and other influencing factors.

As discussed in Section 4.8, implementation of the proposed Plan would decrease GHG emissions in 2025 from 2016 levels. The proposed Plan would not conflict with local climate action plans. However, uncertainty about the ability for GHG emissions to be reduced by national and international efforts means that global GHG emissions may not be reduced to 2016 levels. But because the proposed Plan's GHG emissions decrease between 2012 and 2020, and would not conflict with local climate plans, there is no significant GHG cumulative impact in 2025, and the proposed Plan's incremental contribution would not be cumulatively considerable.

2030 and 2035

Total emissions in the San Diego region in 2030 exceed the regional 2030 GHG reduction reference point based on SB 32 the proposed Plan's 2030 GHG emissions would be inconsistent with state's ability to achieve SB 32 GHG reduction target This would be a significant impact. Also, uncertainty about the ability for GHG emissions to be reduced by national and international efforts means that global GHG emissions may not be reduced on a trajectory consistent with the SB 32 target.

As discussed in Section 4.8, implementation of the proposed Plan in 2035 would decrease GHG emissions from 2016 levels. Moreover, the proposed Plan would not conflict with SB 375 emission reduction targets for 2035 because it would result in a 20 percent reduction in per capita CO_2 emissions from passenger cars and light-duty trucks from 2005 levels by 2035, which exceeds the 2035 target of a 19 percent reduction for the SANDAG

region. The proposed Plan would not conflict with the SANDAG Board Resolution No. 2021-17 or local climate action plans, and the proposed Plan's incremental contribution for those thresholds using the 2035 horizon would not be cumulatively considerable.

Because cumulative GHG impacts on a global basis would be significant, and because the proposed Plan's incremental GHG impacts are significant, the proposed Plan's incremental GHG impacts in 2030 would also be cumulatively considerable (Impact C-GHG-1).

2045 and 2050

As discussed in Section 4.8, implementation of the proposed Plan in 2050 would decrease GHG emissions from 2016 levels. Also, the proposed Plan would not conflict with the SANDAG Board Resolution No. 2021-17 or local climate action plans. However, because total emissions in the San Diego region in 2050 exceed the regional 2045 and 2050 GHG reduction reference points based on EO B-55-18 and EO S-3-05, the proposed Plan's 2050 GHG emissions would be inconsistent with state's ability to achieve the Executive Orders' GHG reduction goals. This would be a significant impact. Also, uncertainty about the ability for GHG emissions to be reduced by national and international efforts means that global GHG emissions may not be reduced on a trajectory consistent with the EO B-55-18 and EO S-3-05 goals.

Because cumulative GHG impacts on a global basis would be significant, and because the proposed Plan's incremental GHG impacts are significant, the proposed Plan's incremental GHG impacts in 2050 would also be cumulatively considerable (Impact C-GHG-1).

Mitigation Measures

C-GHG-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO GHG EMISSIONS

Implementation of Mitigation Measures **GHG-5a** through **GHG-5f** would reduce direct and indirect GHG emission associated with the proposed Plan. These mitigation measures include actions such as competitive grant funding for GHG-reducing projects, allocation of additional funding for electric vehicle-charging infrastructure and incentives, allocation of funding to habitat creation, restoration, or enhancement projects that remove carbon dioxide from the atmosphere, implementing a regional carbon offset program, achieving energy savings through a regional energy network, and measures to reduce GHG emissions from transportation and development projects. Additional mitigation measures that would reduce GHG emissions are presented in the air quality, energy, and water supply sections.

While SANDAG has the authority to implement mitigation measures **GHG 5a** through **GHG-5f**, **AQ-3b**, **AQ-3c**, **AQ-4**, **TRA-2**, **WS-1a**, and **WS-1b** it has committed to, it has no legal authority to require other transportation project sponsors or local jurisdictions to implement mitigation measures for specific projects for which they have responsibility and jurisdiction. Based on the studies described in Section 4.8 in the introduction to the mitigation section, even full implementation of all identified mitigation measures would not be sufficient to reduce the proposed Plan's GHG emissions below the regional 2030, 2035 and 2050 GHG reduction reference points based on SB 32, EO B-55-18 and EO S-3-05. Full implementation of many of the measures that could result in a reduction of GHG emissions. Mitigation measures **GHG-5a** through **GHG-5f** would help reduce regional GHG emissions through reducing VMT, increasing use of alternative fuels, and other measures; they would reduce inconsistency of the proposed Plan's GHG emissions with the state's ability to achieve the SB 32, EO B-55-18, and EO S-3-05 GHG reduction goals. However, full implementation of changes required to achieve

he SB 32 target or Executive Orders' goals is beyond SANDAG's or local agencies' current ability to implement. Because the proposed Plan's 2030, 2045 and 2050 GHG emissions would remain inconsistent with state's current ability to achieve the Executive Orders' GHG reduction goals, this impact (Impact GHG-5) remains cumulatively considerable post-mitigation.

5.2.9 HAZARDS AND HAZARDOUS MATERIALS

C-HAZ-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO HAZARDS AND HAZARDOUS MATERIALS

Generally, the geographic scope of cumulative impact analysis for hazardous materials includes the area immediately surrounding the affected hazardous materials location as the potential risk is limited to the area immediately surrounding the affected hazardous material site or risk generator. However, other topics associated with hazards such as transportation of hazardous materials, wildfire, and flooding can occur at large regional-scales and as a result of growth, population increase, or land use change. Thus, consideration of the Southern California and northern Baja California region is appropriate.

The projection approach is used for the cumulative analysis of hazards and hazardous materials to allow for an overarching discussion of regional and cross-border hazards, associated with general patterns of regional urbanization, growth, and land use changes. The consideration of regional development patterns and changes provides for the ability to assess potential increases to regional hazards and regional transportation of hazardous materials. The cumulative impact is the combination of the impacts of the proposed Plan and impacts on or from hazards and hazardous materials resulting from implementation of approved regional planning documents. Significant cumulative impacts would occur if there were cumulative significant risks of hazardous material emissions, exposure of the public to hazardous materials, air traffic hazards, or impediment of emergency response or evacuation.

This cumulative impact assessment considers and relies on the impact analysis within this EIR for the proposed Plan and the SCAG 2020-2045 RTP/SCS EIR (SCAG 2020). Other plans with applicable information, but no associated environmental analysis include: San Diego County Multi-Jurisdictional Hazard Mitigation Plan (County of San Diego 2017); State of California Emergency Plan (California Emergency Management Agency 2017); and California-Baja California Border Master Plan (Caltrans 2021).

Impacts of the Proposed Plan

Regional growth and land use change and the transportation network improvements included in the proposed Plan would increase the risk of significant hazards to the public and/or the environment through the routine transport, use, or disposal of hazardous materials, and the hazardous emissions generated and hazardous emissions handled during pre-construction, demolition, and construction activities. Future development and transportation network improvements would also occur near public airports and private airstrips, exposing people to aircraft and airport-related safety hazards. Additionally, increased development and transportation network improvements would in some locations cause obstruction for emergency response vehicles or result in activities that would cause physical interference in the implementation of an emergency response and evacuation plans or interfere with adequate emergency access. However, adherence to the existing regulations discussed in Section 4.9 would ensure that these impacts would be less than significant in 2025, 2035, and 2050 (Impact HAZ-1 through HAZ-4).

Impact Projections of Related Projects

The environmental analyses for the other related projects, including the HST, the Airport Master Plan, the City of San Diego Pure Water North City Project, and the Navy Old Town Campus Revitalization determined that these projects have the potential increase the risk of significant hazards to the public and/or the environment through the routine transport, use, or disposal of hazardous materials, and the hazardous emissions generated and hazardous emissions handled during pre-construction, demolition, and construction activities and could have more localized hazardous materials. However, these plans would also be required to adhere to the existing regulations discussed in Section 4.9, and as such these impacts would be less than significant (Impact HAZ-1 through HAZ-4).

Impact Projections in Adopted Plans

The SCAG 2020-2045 RTP/SCS EIR found that the increased mobility accommodated by the transportation investments of the SCAG 2020-2045 RTP/SCS would result in not only increased hazardous materials transport through the SCAG region but also outside the area to result in cumulative impacts throughout Southern California. As the population increases through 2045, the number of trips in the SCAG region that originate, end, or pass through Santa Barbara, San Diego, and Kern counties as well as other counties and states would increase, including trips involving the transportation of hazardous materials. Thus, the 2020-2045 RTP/SCS would contribute to significant hazardous material transportation impacts in these other areas. The SCAG 2020-2045 RTP/SCS EIR also determined that the 2020-2045 RTP/SCS had the potential to create a significant hazard to the public through the reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, emit hazardous materials within one-quarter mile of an existing or proposed school, result in development located on a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, involve projects located within an airport land use plan, or within two miles of a public airport, which could result in a safety hazard or excessive noise for people residing or working in the area; and impair or interfere with an adopted emergency plan.

The County of San Diego and various jurisdictions throughout the county have prepared the San Diego County Multi-Jurisdictional Hazard Mitigation Plan, which provides a risk assessment and identification of hazards prevalent within the region. The plan also outlined mitigation strategies and provided an explanation of how jurisdictions intend to incorporate the mitigation strategies into existing planning mechanisms such as the County Comprehensive Land Use Plan, Capital Improvement Plans, and Building Codes.

The state-wide State of California Emergency Plan addresses the state's response to extraordinary emergency situations associated with natural disasters or human-caused emergencies and describes the methods for carrying out emergency operations, the process for rendering mutual aid, the emergency services of governmental agencies, how resources are mobilized, how the public will be informed and the process to ensure continuity of government during an emergency or disaster. While no environmental analysis accompanies the plan, the State Emergency Plan emphasizes mitigation programs to reduce the vulnerabilities to disaster and preparedness activities to ensure the capabilities and resources are available for an effective response (California Emergency Management Agency 2017).

The California-Baja California Border Master Plan is a binational comprehensive approach to coordinate planning and delivery of projects at land POEs and transportation infrastructure serving those POEs in the California-Baja California region (Caltrans 2021). The Master Plan does not have an associated environmental analysis document; however, it is reasonable to assume that projects included in the Master Plan could have adverse impacts related to hazards, including hazardous materials, airport safety hazards, and interference

with emergency and evacuation plans. Construction of new facilities could add to impacts from the projects associated with both the SANDAG and SCAG RTP/SCSs as they add to the increased mobility and transportation access throughout the California-Baja California region.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan impacts of related projects, and impact projections from adopted plans within the Southern California and northern Baja region were significant when considered together, even if not independently significant. Future development associated with increased population growth forecasted in the proposed Plan would increase the number of people exposed to impacts related to hazardous materials, airport safety hazards, and interference with emergency response or emergency evacuation. Impacts associated with these hazards would generally be confined to a specific project area, rather than result in an incremental cumulative effect spread over the Southern California and northern Baja region. Adherence to federal, state, and local regulations as described in Section 4.9 would reduce incremental impacts associated with exposure to hazards and hazardous materials in each of the affected project areas. Though projects located in Mexico would not be subject to such regulations, all development throughout the region within the U.S. would be fully regulated and therefore cumulative impacts associated with exposure to hazards and hazardous materials would be less than significant.

Future development and transportation network improvements forecasted in the proposed Plan would also occur near public airports and private airstrips, exposing people to aircraft and airport-related safety hazards. Related development infrastructure projects in the Southern California and northern Baja region would result in changed land uses within the vicinity of a public airport or a private airstrip, and safety hazards for people residing or working in these project areas. However, cumulative projects in the U.S. would be subject to safety regulations as discussed in Section 4.9, such as ALUCPs, FAA standards, and the State Aeronautics Act, which minimize airport hazards. Therefore, cumulative impacts associated with exposing people to aircraft and airport-related safety hazards near both public airports and private airstrips/helipads would be less than significant.

Additionally, increased development and transportation network improvements in the proposed Plan would in some locations cause obstruction for emergency response vehicles or result in activities that would cause physical interference in the implementation of an emergency response and evacuation plans. Related growth, development, and infrastructure projects in the Southern California and northern Baja region would also impair existing emergency and evacuation plans. However, cumulative projects in the U.S. would be required to adhere to the applicable emergency response and evacuation policies outlined in regulations discussed in Section 4.9. Therefore, cumulative impacts associated with the interference in the implementation of an emergency response and evacuation plans would be less than significant.

2035

The cumulative analysis presented above for the horizon year of 2025 would be applicable to year 2035. Therefore, less-than-significant cumulative impacts would be associated with significant hazards to the public and/or the environment through the routine transport, use, or disposal of hazardous materials; hazardous emissions emitted during construction activities; exposing people to aircraft and airport related safety hazards near public airports and private airstrips; and the physical interference in the implementation of an emergency

response and evacuation plan. Cumulative impacts associated with hazards and hazardous materials would be less than significant.

2050

The cumulative analyses presented above for the horizon years of 2020 and 2035 would be applicable to year 2050. Therefore, there would be less-than-significant cumulative impacts associated with significant hazards to the public and/or the environment through the routine transport, use, or disposal of hazardous materials; accidental release of hazardous materials into the environment; hazardous emissions emitted during construction activities; exposing people to aircraft and airport-related safety hazards near public airports and private airstrips; and the physical interference in the implementation of an emergency response and evacuation plan. Cumulative impacts associated with hazards and hazardous materials would be less than significant.

Mitigation Measures

None required.

5.2.10 HYDROLOGY AND WATER QUALITY

C-HWQ-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO HYDROLOGY AND WATER QUALITY

The area of geographic consideration for cumulative impacts on hydrology and water quality is the Southern California and northern Baja region. The analysis of cumulative hydrology and water quality impacts considers how land use change and the transportation system would influence hydrology and water quality across the Southern California and northern Baja region as a whole because the majority of water bodies within the San Diego area are part of hydrologic systems located in multiple jurisdictions. As a result, water pollution or alterations to a portion of a watershed produced by urban development in one jurisdiction can result in hydrology and water quality impacts that affect other jurisdictions or the entire region.

A projection approach for hydrology and water quality cumulative analysis allows for an overarching discussion of regional and cross-border impacts throughout multiple watersheds relative to hydrology and water quality associated with general patterns of regional urbanization, growth, and land use changes. The cumulative impact is the combination of the impacts of the proposed Plan and impact projections in adopted regional documents addressing water quality or hydrology. Significant cumulative impacts related to hydrology and water quality would occur if there were a: substantial degradation of water quality in violation of any water quality standards or waste discharge requirements; substantial reduction in groundwater quantity or quality; substantial alteration of the existing drainage pattern of an area such that flood risk, erosion, or siltation would increase; exposure of people, structures, or facilities to a significant risk involving flooding; or exposure of people or structures to a significant risk of inundation by seiche, tsunami, or mudflow.

Some of the plans considered in the cumulative analysis include the Water Quality Control Plans for the five basins within the greater region: San Diego Basin, Colorado River Basin, Santa Ana Basin, Los Angeles Basin, and the Lahontan Basin. As discussed in Section 4.10, these basin plans set forth water quality objectives for constituents that could have a significant impact related to the beneficial uses of water. Additionally, the San Diego Integrated Regional Water Management (IRWM) Plan was considered (Regional Water Management Group 2019). While these documents do not have accompanying environmental analysis, they provide

important overarching strategies, future planning considerations, and planned large projects related to water quality and hydrology throughout the region.

Impacts of the Proposed Plan

Compliance with existing regulatory requirements described in Section 4.10 would ensure that the regional growth and land use change and the transportation network improvements would not result in: substantial degradation of water quality in violation of any water quality standards or waste discharge requirements; substantial reduction in groundwater quantity or quality; substantial alteration of the existing drainage pattern of an area such that flood risk, erosion, or siltation would increase; exposure of people, structures, or facilities to a significant risk involving flooding; or exposure of people or structures to a significant risk of inundation by seiche, tsunami, or mudflow. These impacts would be less than significant in 2025, 2035, and 2050 (Impact HWQ-1 through HWQ-4).

Impact Projections in Adopted Plans

The SCAG 2020-2045 RTP/SCS EIR identified the potential to violate water quality standards associated with wastewater and storm water permits. The EIR also concluded that the 2020-2045 RTP/SCS would alter the existing drainage patterns in ways that would result in substantial erosion or siltation. Implementation was found to also reduce groundwater infiltration due to increased impervious surfaces and increase flooding hazards by locating projects on alluvial fans and within 100-year flood hazard areas. These water quality and hydrology impacts would be significant and unavoidable, even with the implementation of proposed mitigation (SCAG 2020).

This 2019 IRWM Plan was prepared by the San Diego Regional Water Management Group which consists of the SDCWA, the City of San Diego, and the County of San. IRWM planning is a relatively new California initiative with regional plans designed to improve collaboration in water resources management and comprehensively address all aspects of water management and planning throughout an IRWM Region. IRWM plans cross jurisdictional, watershed, and political boundaries; involve multiple agencies, stakeholders, individuals, and groups; and attempt to address the issues and differing perspectives of all the entities involved through mutually beneficial solutions. Specific to water quality, the IRWM includes Objective H to effectively reduce sources of pollutants and environmental stressors to protect and enhance human health, safety, and the environment (Regional Water Management Group 2019).

Water Quality Control Plans or Basin Plans have been written by each RWQCB. These plans determine the beneficial uses of each water body within the basin and set forth narrative and numerical water quality objectives for constituents that could have a substantial impact related to those beneficial uses. They also describe implementation programs to protect the beneficial uses of all water in the region, and surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan. For example, the San Diego Basin Plan includes multiple policies specific to the protection of water quality including Policy Three: Point sources and nonpoint sources of pollution shall be controlled to protect designated beneficial uses of water and Policy Four: Instream beneficial uses shall be maintained, and when practical, restored, and enhanced (CRWQCB 2016).

Adopted land use plans for local jurisdictions in Southern California would support the construction of new development and redevelopment through policy changes, general plan updates, and zoning amendments that encourage and facilitate population growth and land use changes. These development projects would impact hydrology and water quality. The severity of these impacts would be determined by location of the projects within the watersheds, and the sensitivity of the receiving bodies and the types of BMPs employed. All U.S.

projects would be required to adhere to all of the regulatory requirements described in Section 4.10. Projects associated with policy changes and amendments would also impact hydrology and water quality, for the same reasons as discussed with infrastructure projects.

Waste discharges into some receiving waters from northern Baja California would ultimately enter the Tijuana River and the Pacific Ocean where the waste would impact beaches in the southern part of the San Diego region. The Tijuana River is a 303(d) listed water body for various impairments. The Tijuana River Estuary, a National Estuarine Sanctuary, supports a variety of threatened and endangered plants and animals and is 303(d) listed for eutrophic conditions, indicator bacteria, lead, low dissolved, oxygen, nickel, pesticides, thallium, trash, toxicity, and turbidity (SWRCB 2021). Discharges from northern Baja, which are not controlled by regional regulations, would impact these water bodies within the region.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combined impacts of proposed Plan and impact projections from adopted plans within the Southern California and northern Baja region were significant when considered together, even if not independently significant. As described above, federal, state, and local water quality requirements would ensure that implementation of the proposed Plan would not result in: substantial degradation of water quality in violation of any water quality standards or waste discharge requirements; substantial reduction in groundwater quantity or quality; substantial alteration of the existing drainage pattern of an area such that flood risk, erosion, or siltation would increase; exposure of people, structures, or facilities to a significant risk involving flooding; or exposure of people or structures to a significant risk of inundation by seiche, tsunami, or mudflow. Cumulative impacts on these resources would be less than significant due to federal and state regulatory requirements also applicable to development throughout the region for the protection of water quality objectives to protect beneficial uses throughout Southern California, and the effectiveness of regulations pertaining to water quality and hydrologic modifications. However, cumulative water quality impacts occur as polluted water from northern Baja California, which is not subject to federal and state regulatory requirements discharges into the Tijuana River and affects the quality of receiving waters throughout the region. While cumulative impacts exist due to unregulated polluted water that enters the region, the proposed Plan would not add to this cumulative water quality impact for the reasons outlined above, including adherence to federal and state regulatory requirements. Thus, the cumulative water quality impact would not be significant, and the proposed Plan's contribution to the cumulative water quality impact would not be cumulatively considerable in 2025.

2035

As described above, federal, state, and local water quality requirements would ensure that implementation of the proposed Plan would not result in a substantial degradation of water quality in violation of any water quality standards or waste discharge requirements; substantial reduction in groundwater quantity or quality; substantial alteration of the existing drainage pattern of an area such that flood risk, erosion, or siltation would increase; exposure of people, structures, or facilities to a significant risk involving flooding; or exposure of people or structures to a significant risk of inundation by seiche, tsunami, or mudflow. Cumulative impacts on these resources from water sources originating in the United States would be less than significant due to federal and state regulatory requirements also applicable to development throughout the region for the protection of water quality objectives to protect beneficial uses throughout Southern California, and the effectiveness of regulations pertaining to water quality and hydrologic modifications.

However, cumulative water quality impacts occur as polluted water from northern Baja California, which is not subject to federal and state regulatory requirements, discharges into the Tijuana River and affects receiving waters throughout the region. While cumulative impacts exist due to unregulated polluted water that enters the region, the proposed Plan would not add to this cumulative water quality impact for the reasons outlined above, including adherence to federal and state regulatory requirements. Thus, the cumulative water quality impact would not be significant, and the proposed Plan's contribution to the cumulative water quality impact would not be cumulatively considerable in 2035.

2050

As described above, federal, state, and local water quality requirements would ensure that implementation of the proposed Plan would not result in a result in a substantial degradation of water quality in violation of any water quality standards or waste discharge requirements; substantial reduction in groundwater quantity or quality; substantial alteration of the existing drainage pattern of an area such that flood risk, erosion, or siltation would increase; exposure of people, structures, or facilities to a significant risk involving flooding; or exposure of people or structures to a significant risk of inundation by seiche, tsunami, or mudflow. Cumulative impacts on these resources would be less than significant due to federal and state regulatory requirements also applicable to development throughout the region for the protection of water quality objectives to protect beneficial uses throughout Southern California, and the effectiveness of regulations pertaining to water quality and hydrologic modifications.

However, cumulative water quality impacts occur as polluted water from northern Baja California, which is not subject to federal and state regulatory requirements, discharges into the Tijuana River and affects receiving waters throughout the region. While cumulative impacts exist due to unregulated polluted water that enters the region, the proposed Plan would not add to this cumulative water quality impact for the reasons outlined above, including adherence to federal and state regulatory requirements. Thus, the cumulative water quality impact would not be significant, and the proposed Plan's contribution to the cumulative water quality impact would not be cumulatively considerable in 2050.

Mitigation Measures

Mitigation measures are not required.

5.2.11 LAND USE AND PLANNING

C-LU-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO LAND USE AND PLANNING

The geographic scope for the land use cumulative analysis is the Southern California region. While land uses and development patterns are typically established in local land use planning documents specific to jurisdictions, it is important to consider land use change and how the transportation system would influence the development pattern across the Southern California region as a whole because land uses merge and flow together along jurisdictional boundaries. A wide variety of land use patterns and development types can be found throughout the Southern California region including urban and rural development, commercial and industrial developments, military installations, tribal reservations, agricultural land, parks and open space, and habitat conservation areas.

Use of the hybrid approach for the analysis of cumulative land use impacts allows for an overarching discussion of regional land use capability, conflicts, or other land use impacts associated with general patterns of regional

urbanization, growth, and land use changes. As shown in Table 5-1, the population throughout the Southern California region is forecasted to steadily increase throughout 2050.

The cumulative impact is the combination of the land use impacts of the proposed Plan, land use impact projections in adopted plans, and impacts on land use resulting from substantial regional projects. Significant cumulative impacts related to land use would occur if established communities are physically divided, or if conflicts are created with land use plans adopted for the purpose of avoiding or mitigating an environmental effect.

This cumulative land use impact assessment considers the impact analysis presented in the SCAG 2020-2045 RTP/SCS and its EIR (SCAG 2020a, 2020b). The SCAG 2020-2045 RTP/SCS and associated EIR generally encompass Imperial, Orange, San Bernardino, Riverside, Los Angeles, and Ventura counties. The San Diego County General Plan and its EIR (County of San Diego 2011) was used to consider land use effects within San Diego County. Additionally, multiple agencies and jurisdictions have land use control throughout the region, including local cities and counties, numerous military branches, tribal governments, state and federal agencies, port authorities, and airport authorities that outline their policies in various planning documents.

Impacts of the Proposed Plan

The land use patterns outlined in the proposed Plan focus greater development intensity in existing urban centers. The pattern of more intensive land uses, along with the transit improvements planned to service higher intensity residential, commercial, and employment centers, is generally in character with the lifestyle and character typical of compact urban communities. Impacts of growth and land use change on physically dividing an established community would be less than significant. However, transportation network improvements, such as new commuter rail extensions into previously unserved areas, could in some locations result in a physical division of an established community in 2025, 2035 and 2050 (Impact LU-1).

Development patterns and growth forecasted to occur under the proposed Plan would generally be consistent with applicable land use plans; in a few cases, the SCS land use pattern may conflict with specific land use designations in General Plans, but impacts of SCS implementation are already evaluated in other sections of this EIR so these conflicts would not cause new significant impacts. However, some transportation network improvements, such as commuter line extensions into previously unserved areas, would in some locations conflict with land use portions of adopted general plans or other applicable land use plans, and but also would be less than significant because impacts of SCS implementation are already evaluated in other sections of this EIR (Impact LU-2) .

Impacts of Related Projects

Projects planned in the Southern California and northern Baja region, such as the HST, border/POE facility improvements, airport expansions in the San Diego region**,** port/maritime improvements associated with Port for All, or long linear projects such as rail pipeline or energy transmission infrastructure, would result in impacts related to the physical division of established communities or conflicts with adopted general plans or other applicable land use plans. For example, the HST project in the San Diego region would result in property acquisition along existing rights of way and some acquisition along new rights of way in undeveloped areas, resulting in significant displacement and land use compatibility impacts (HSRA 2005). The EIR/EIS prepared for the HST project determined that the project would result in significant cumulative impacts on land use. The EIR for the SDIA Airport Development Plan identified significant land use impacts due to conflict with certain aspects of land use plans, policies or regulations adopted for the purpose of avoiding or mitigating an

environmental effect. The project would generate future noise and traffic impacts that are in conflict with certain community plans and policies, resulting in significant and unavoidable impacts (SDIA 2019).

The EIS for the Navy OTC Revitalization Project evaluated several alternatives and determined that the project would result in increased density under several alternative options that would contribute to significant additional proposed growth in dwelling units, population, jobs, and non-residential uses over the targets contained in the applicable community plan.

Impact Projections in Adopted Plans

The SCAG 2020-2045 RTP/SCS EIR found that implementation of the Connect SoCal Plan has the potential to physically divide an established community and to conflict with existing land use plans. The proposed Plan would result in an increase in density and land use development. Improved accessibility from the proposed Plan could help facilitate urbanization to areas outside the region. Furthermore, changes in land use patterns in the region (i.e., increased urbanization) could affect areas outside the region, resulting in increased urbanization in adjacent jurisdictions, which would result in a regionally significant land use impacts (SCAG 2020a).

The County of San Diego General Plan Update EIR identified a potentially significant cumulative impact associated with the physical division of an established community due to future roadway development under the proposed General Plan Update, including new roads, road extensions, and widening of existing roads throughout the County. The EIR found that the General Plan Update would not contribute to a significant cumulative impact associated with conflicts with local plans, policies, and regulations (County of San Diego 2011).

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan and impact projections from adopted plans within the Southern California region were significant when considered together, even if not independently significant. As described above, implementation of the transportation network improvements as considered in the proposed Plan would result in the division of established communities and conflict with land use plans in 2025.

The combination of the direct land use impacts from the proposed Plan together with impacts of the adopted plans and related projects described above, including the Navy OTC Revitalization, SDIA Airport Development Plan, HST, SCAG 2020-2045 RTP/SCS and the County of San Diego General Plan Update would result in significant cumulative land use impacts regarding the division of an established community by 2025.

Because cumulative land use impacts throughout the Southern California region by 2025 would be significant, and because the proposed Plan's incremental land use impacts associated with transportation network improvements are significant, the proposed Plan's incremental land use impacts are also cumulatively considerable (Impact C-LU-1).

2035

As described above, implementation of the transportation network improvements such as commuter rail extensions into previously unserved areas in the proposed Plan would result in the division of established communities in 2035. The combination of the direct land use impacts from the proposed Plan together with impacts of the adopted plans and related projects described above, including the Navy OTC Revitalization, SDIA Airport Development Plan, HST, SCAG 2020-2045 RTP/SCS and the County of San Diego General Plan Update would result in significant cumulative land use impacts regarding the division of an established community by 2035.

Because cumulative land use impacts throughout the Southern California region by 2035 would be significant, and because the proposed Plan's incremental land use impacts are significant, the proposed Plan's incremental land use impacts are also cumulatively considerable (Impact C-LU-1).

2050

As described above, implementation of the transportation network improvements such as commuter rail extensions into previously unserved areas in the proposed Plan would result in the division of established communities and conflict with land use portions of adopted general plans or other applicable land use plans in 2050. The 2050 time period is beyond the planning horizon of the adopted 2020-2040 SCAG RTP/SCS and the County General Plan Update does not specify a planning horizon date. However, with anticipated long-term growth and development throughout the region, it can be expected that similar land use impacts would continue throughout the planning area. The combination of the direct land use impacts from the proposed Plan together with impacts of the adopted plans described above, including the Navy OTC Revitalization, SDIA Airport Development Plan, HST**,** SCAG 2020-2045 RTP/SCS and the County of San Diego General Plan Update would result in significant cumulative land use impacts regarding the division of an established community by 2050.

Because cumulative land use impacts throughout the Southern California region by 2050 would be significant, and because the proposed Plan's incremental land use impacts are significant, the proposed Plan's incremental land use impacts are also cumulatively considerable (Impact C-LU-1).

Mitigation Measures

C-LU-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO LAND USE AND PLANNING

Mitigation Measure **LU-1** to reduce land use impacts due to transportation improvements as identified in Section 4.11 would be applicable to cumulative land use impacts. Mitigation measure **LU-1** calls for design of transportation network improvements to provide access and connections to and within established communities.

The SCAG 2020-2045 RTP/SCS EIR provided a wide variety of mitigation measures to address land use conflicts and impacts; however, even with implementation of mitigation, the EIR concluded that land use impacts would remain significant and unavoidable (SCAG 2020a). The County of San Diego General Plan Update EIR required mitigation to reduce the potentially significant cumulative impact related to the division of a community to less than significant. Mitigation included coordination with adjacent cities and agencies regarding planning and transportation improvements, coordination with land owners, other departments and community groups, and maintenance plans and standards for infrastructure and roads so that community division does not occur. The

cumulative impact was found to be less than significant after the application of mitigation (County of San Diego 2011).

The overall proposed redevelopment associated with the Navy OTC Revitalization project would represent a change from existing land use and a recreation shortfall from the goals in the community plans. Therefore, implementation of the alternatives when combined with the past, present, and reasonably foreseeable actions would result in significant cumulative impacts on land use within the project study area.

The SDIA Airport Development Plan found that with implementation of mitigation measures, land use planning inconsistency impacts would be less than significant, but impacts related to noise and traffic incompatibilities would remain significant and unavoidable.

As outlined in Section 4.11, mitigation measures would not guarantee reduction of all proposed Plan land use impacts to below a level of significance. Therefore, the proposed Plan's incremental contributions to the cumulative land use impacts in years 2025, 2035 and 2050 would remain cumulatively considerable post-mitigation.

5.2.12 MINERAL RESOURCES

C-MR-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO MINERAL RESOURCES

The area of geographic consideration for cumulative impacts is the Southern California and northern Baja region. While some mineral resources can be distinct to certain locations, they are not confined by jurisdictional boundaries. Thus, it is necessary to consider availability of mineral resources in Southern California and northern Baja as a whole region.

A projection approach for cumulative analysis of mineral resources allows for an overarching discussion of regional and cross-border loss of availability of mineral resources associated with general patterns of regional urbanization, growth, and land use changes. The cumulative impact is the combination of the impacts of the proposed Plan and impacts on mineral resources resulting from implementation of approved regional planning documents. Significant cumulative impacts would occur if there were cumulative risks of loss of availability of valuable mineral resources or recovery sites in Southern California and northern Baja.

This cumulative impact assessment considers and relies on the impact analysis within this EIR for the proposed Plan, and SCAG 2020-2045 RTP/SCS EIR (SCAG 2020b) for the Southern California region. There are generally no regional plans pertaining to such resources for the northern Baja California region.

Impacts of the Proposed Plan

Regional growth and land use changes and transportation network improvements associated with the proposed Plan would cause loss of availability of known mineral resources, as land development and transportation network improvements would encroach into MRZs and other locally important resource recovery sites, resulting in the loss of 853 acres of MRZ-2 lands by 2050. As such, mineral resources impacts would be significant for 2025, 2035, and 2050 (Impact MR-1).

Impact Projections in Adopted Plans

The EIR prepared for the SCAG 2020-2045 EIR/SCS RTP analyzed impacts on the SCAG region up to 2045 and identified significant and unavoidable impacts related to the loss of availability of known mineral resources. The EIR also found that the 2020-2045 SCAG RTP/SCS would contribute to cumulatively considerable impacts on mineral resources (SCAG 2020a). Adopted land use plans for local jurisdictions in Southern California and northern Baja would support the construction of new development and redevelopment through policy changes, general plan updates, and zoning amendments that encourage and facilitate population growth and land use changes. Development associated with the implementation of regional planning documents would in some cases also impact availability of known mineral resources, as development would likely occur in some locations within MRZs or resource recovery sites.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combination of impacts of the proposed Plan and impact projections from adopted plans within the Southern California and northern Baja region were significant when considered together, even if not independently significant.

The proposed Plan would significantly impact loss of availability of known mineral resources due to development in locations within MRZs or resource recovery sites. Combined with loss of availability of mineral resources from implementation of adopted regional planning documents, impacts from the proposed Plan would also result in significant cumulative impacts on availability of known mineral resources.

Because cumulative mineral resources impacts throughout the Southern California and northern Baja region by 2025 would be significant, and because the proposed Plan's incremental impacts on these resources are significant, the proposed Plan's incremental impacts on mineral resources are cumulatively considerable (Impact C-MR-1).

2035

The proposed Plan would also significantly impact loss of availability of known mineral resources due to development in locations within MRZs or resource recovery sites. Combined with loss of availability of mineral resources from implementation of adopted regional planning documents, impacts from the proposed Plan would also result in significant cumulative impacts on availability of known mineral resources in 2035.

Because cumulative mineral resources impacts throughout the Southern California and northern Baja region by 2035 would be significant, and because the proposed Plan's incremental impacts on these resources are significant, the proposed Plan's incremental impacts on mineral resources are cumulatively considerable (Impact C-MR-1).

2050

The proposed Plan would also significantly impact loss of availability of known mineral resources due to development in locations within MRZs or resource recovery sites. Combined with loss of availability of mineral resources from implementation of adopted regional planning documents, impacts from the proposed Plan would also result in significant cumulative impacts on availability of known mineral resources in 2050.

Because cumulative mineral resource impacts throughout the Southern California and northern Baja region by 2050 would be significant, and because the proposed Plan's incremental impacts on these resources are significant, the proposed Plan's incremental impacts on mineral resources are cumulatively considerable (Impact C-MR-1).

Mitigation Measures

C-MR-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO MINERAL RESOURCES

Mitigation measures **MR-1a** and **MR-1b** would conserve aggregate and mineral resources through avoidance of aggregate and mineral resources, or incorporation of appropriate design features to reduce impacts on resources when avoidance is not feasible. However, as outlined in Section 4.7, this mitigation measure would not guarantee that all proposed Plan impacts on availability of known mineral resources would be less than significant. Therefore, the proposed Plan's incremental contributions to cumulative impacts on availability of known mineral resources in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

5.2.13 NOISE AND VIBRATION

C-NOI-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO NOISE AND VIBRATION

The geographic scope for the noise and vibration cumulative analysis is the Southern California and northern Baja Mexico region. Transportation networks, including facilities such as the regional roadway/Interstate networks, rail lines, and airports, are large contributors to environmental noise in the region. Development, growth, population increase, or land use change can cause an increase in ambient noise and vibration directly related to the type of development, increased use of transportation facilities and the general introduction of new sources of noise and vibration.

This cumulative noise impact assessment considers the impact analysis presented in the SCAG 2020-2045 RTP/SCS and its EIR (SCAG 2020a, 2020b); California-Baja California Border Master Plan (Caltrans 2021); and the ~~2008~~ 2019 San Diego International Airport Development Plan~~, Airport Master Plan Environmental Impact Report~~ EIR (SDCRAA 2019a~~08~~).

Impacts of the Proposed Plan

The analysis of the proposed Plan shows that regional growth and land use change associated with the proposed Plan would expose noise-sensitive receptors to noise levels in excess of applicable noise standards, and transportation network improvements associated with the proposed Plan would generate construction and operational noise levels that would expose noise-sensitive receptors (i.e., residences, churches, hospitals, etc.) to noise levels in excess of applicable noise standards. This exposure of persons to or generating noise levels exceeding applicable noise standards established by local jurisdictions and/or other agencies is considered a significant impact in horizon years 2025, 2035, and 2050 (Impact NOI-1).

Regional growth land use change and transportation network improvements under the proposed Plan in horizon years 2025, 2035, and 2050 would also result in conditions where construction of new development and transportation network improvements would temporarily increase noise levels during construction at surrounding land uses. While construction-related noise impacts would be short term and localized in nature,

construction would result in a substantial increase in ambient noise level or would result in exceedances of applicable noise standards established by local jurisdictions and/or other agencies, which would be a significant impact in 2025, 2035, and 2050 (Impact NOI-1).

Under the proposed Plan, land use development increase relative to the existing development, which would expose noise-sensitive receptors in close proximity to new noise sources. The increases in population, housing, and employment in the proposed Plan would result in increases in noise levels by the placement of operational stationary and traffic noise sources from new residential, commercial, or industrial uses in proximity to noise sensitive receptors. The transportation network improvements in the proposed Plan would permanently increase ambient noise levels adjacent to transportation network improvements. Ambient noise level increases associated with transportation network improvements would primarily result from forecasted regional population growth, the improvements to the transportation networks which removed shielding or move the facility close to noise sensitive land uses, and the increases in the number of trucks, buses, and trains operating forecasted under the proposed Plan, which generate greater noise per vehicle than automobiles (Caltrans 2013). These substantial permanent increases in ambient noise levels due to regional growth and land use change, and transportation network improvements are considered a significant noise impact in 2025, 2035, and 2050 (Impact NOI-1).

Implementation of regional growth and land use change, as well as transportation network improvements and programs, associated with the proposed Plan would also result in exposure of persons to or generation of excessive groundborne vibration and groundborne noise during certain construction activities in 2025, 2035, and 2050 (Impact NOI-2).

The growth and land use changes of the proposed Plan would occur near public use or military airports, and private airstrips or helipads; however, existing aviation regulations, procedures, ALUCPs, and AICUZ studies would ensure compatibility with public use or military airports, and FAA and Caltrans regulations would ensure compatibility with private airstrips or helipads. Therefore, the impact of exposing people to excessive aviation noise would be less than significant in 2025, 2035, and 2050 (Impact NOI-3).

Impact of Related Projects

Other related regional projects, such as the HST, could have more localized construction and operational noise impacts which would occur along the project alignment. Other land development and infrastructure projects throughout the region and state, such as petroleum pipeline transportation infrastructure, and freight rail infrastructure, and energy generation and transmission corridors, would also impacts related to noise if these projects occur in close proximity to one another as well as within the same time frame.

Both the Navy Old Town Campus Revitalization and City of San Diego Pure Water North City Project would result in impacts, however, impacts associated with noise would be significant and mitigated to a level of less than significant respectively. Impacts would similarly be cumulatively considerable, if these projects occur in close proximity to one another as well as within the same time frame.

Impact Projections in Adopted Plans

The SCAG 2020-2045 RTP/SCS EIR found that construction activities associated with the proposed transportation projects and development projects in the 2020-2045 RTP/SCS would temporarily generate substantial noise and vibration levels above ambient background levels, sometimes for extended duration, and would result in a significant impact. Additionally, noise-sensitive land uses could be exposed to operational

noise in excess of normally acceptable noise levels and/or could experience substantial increases in noise as a result of the operation of expanded or new transportation facilities or increased transportation activity. The EIR also found that the 2020-2045 RTP/SCS would contribute to cumulative ambient noise and vibration levels in areas outside the region as a result of the operation of expanded or new transportation facilities (i.e., increased traffic resulting from new infrastructure and use of new and existing transit and rail facilities) (SCAG 2020b).

The California-Baja California Border Master Plan is a binational comprehensive approach to coordinate planning and delivery of projects at land POEs and transportation infrastructure serving those POEs in the California-Baja California region. The Master Plan does not have an associated environmental analysis document; however, projects included in the Master Plan could have adverse noise impacts due to the expansion of existing, and development of new, transportation facilities that could generate noise and vibration in excess of the ambient condition.

The 2019 San Diego International Airport Development Plan EIR (SDCRAA 2019a) ~~2008 San Diego International Airport, Airport Master Plan EIR (SDCRAA 2008) was certified in May 2008 by the Airport Authority Board. The EIR~~ considered potential aviation, surface transportation, construction, and cumulative noise impacts associated with the Airport ~~Master~~ Development Plan and its alternatives. The EIR found that ~~no~~ the Airport Development Plan's cumulative noise impact would ~~occur~~ be cumulatively considerable in combination with aircraft and ~~highway~~ roadway noise exposure levels. Construction ~~and surface transportation~~ noise changes due to the Airport ~~Master Plan~~Development Plan were found to be less than significant. ~~The EIR also identified no substantial change in noise affecting sleep or affecting schools and found a less-than-significant impact in terms of cumulative aircraft-induced noise exposure due to the Airport Master Plan or its alternatives (SDCRAA 2008).~~

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combination of impacts of the proposed Plan, and impact projections from adopted plans were significant when considered together, even if not independently significant. As described above, implementation of the proposed Plan's transportation network improvements and future development would cause exceedances of noise standards or increases in ambient noise and result in substantial short-term and permanent increases in the existing noise environment at adjacent sensitive land uses in 2025. In addition, significant noise impacts have been identified in other regional environmental analysis documents. The combination of the direct noise impacts from the proposed Plan and other adopted plans that would affect the San Diego and northern Baja region would therefore result in significant cumulative noise impacts, based on exposure to or generation of: noise levels in excess of standards, substantial temporary and permanent increases in noise levels, and excessive groundborne vibration and groundborne noise. Because cumulative noise impacts throughout the San Diego and northern Baja region by 2025 would be significant, and because the proposed Plan's incremental noise impacts are significant, the proposed Plan's incremental noise impacts are also cumulatively considerable (Impact C-NOI-1).

As described above, implementation of the proposed Plan would not cause exposure to excessive aviation noise due to regional growth and land use change or transportation improvements and related noise impacts would be less than significant. ~~Similarly~~As discussed above, while the ~~2008~~ 2019 San Diego International Airport~~, Airport Master~~ Development Plan EIR identified ~~no~~ a cumulative aircraft-induced noise exposure due to the Airport ~~Master~~ Development Plan (SDCRAA ~~2008~~2019a), the proposed Plan's impacts related to aircraft noise

exposure would be less than significant. As such, the proposed Plan would not contribute to cumulative impacts related to aircraft noise and ~~. Because significant cumulative noise impacts associated with exposure of people to excessive noise levels from aircraft operations would not occur within the region,~~ the proposed Plan's less-than-significant noise impacts associated with aircraft noise exposure are not cumulatively considerable.

2035

As described above, implementation of the proposed Plan's transportation network improvements and regional growth and land use change would cause exceedances of noise standards and result in substantial temporary and permanent increases in the existing noise environment at adjacent sensitive land uses in 2035. In addition, significant noise impacts were also identified in other regional environmental analysis documents. The combination of the direct noise impacts from the proposed Plan and other adopted plans that would affect the San Diego and northern Baja region would result in significant cumulative noise impacts, based on exposure to or generation of: noise levels in excess of standards, substantial temporary and permanent increases in noise levels, and excessive groundborne vibration and groundborne noise. Because cumulative noise impacts throughout the San Diego and northern Baja region by 2035 would be significant, and because the proposed Plan's incremental noise impacts are significant, the proposed Plan's impacts are also cumulatively considerable (Impact C-NOI-1).

As described for 2025, ~~because~~ while significant cumulative noise impacts associated with exposure of people to excessive noise levels from aircraft operations would ~~not~~ occur within the region, the proposed Plan's less-than-significant noise impacts associated with aircraft noise exposure would not result in a cumulatively considerable contribution to aircraft noise exposure, and the proposed Plan's impacts related to aircraft noise exposure are not cumulatively considerable in 2035.

2050

As described above, implementation of the proposed Plan's transportation network improvements and regional growth and land use change would cause exceedances of noise standards and result in substantial temporary and permanent increases in the existing noise environment at adjacent sensitive land uses in 2050. In addition, significant noise impacts were also identified in other regional environmental analysis documents. The combination of the direct noise impacts from and the proposed Plan and other adopted plans that would affect the San Diego and northern Baja region would result in significant cumulative noise impacts, based on exposure to or generation of: noise levels in excess of standards, substantial temporary and permanent increases in noise levels, and excessive groundborne vibration or groundborne noise. Because cumulative noise impacts throughout the San Diego and northern Baja region by 2050 would be significant, and because the proposed Plan's incremental noise impacts are significant, the proposed Plan's incremental noise impacts are also cumulatively considerable (Impact C-NOI-1).

As described for 2025, ~~because~~ while significant cumulative noise impacts associated with exposure of people to excessive noise levels from aircraft operations would ~~not~~ occur within the region, the proposed Plan's less-than-significant noise impacts associated with aircraft noise exposure would not result in a cumulatively considerable contribution to aircraft noise exposure, and the proposed Plan's impacts related to aircraft noise exposure are not cumulatively considerable in 2050.

Mitigation Measures

C-NOI-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO NOISE AND VIBRATION

Mitigation measure **NOI-1a** calls for construction noise reduction measures to meet local noise standards and reduce temporary noise levels during construction and mitigation measures **NOI-1b** and **NOI-1c** call for operational noise reduction measures for transportation network improvements and development projects, respectively, to be implemented to meet local standards and reduce permanent noise levels during operations. As outlined in Section 4.13, mitigation measures would reduce noise impacts but would not guarantee reduction of all proposed Plan noise impacts on below a level of significance for all projects. Therefore, the proposed Plan's incremental contributions to cumulative noise impacts in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

Mitigation measure **NOI-2a** calls for groundborne vibration and groundborne noise reduction measures to be implemented during construction activities and mitigation measure **NOI-2b** requires groundborne vibration and groundborne noise-reducing measures for rail operations. As outlined in Section 4.13, mitigation measures would reduce significant increases in groundborne vibration and groundborne noise for some projects; however, it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, the proposed Plan's incremental contributions to cumulative groundborne vibration and groundborne noise impacts in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

5.2.14 POPULATION AND HOUSING

C-POP-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO POPULATION AND HOUSING

The area of geographic consideration for cumulative impacts is the Southern California and northern Baja region. Large-scale land use change and the effectiveness of the transportation system influence the regional development pattern that dictates the location, timing, and amount of resulting population and housing increases or decreases across the region as a whole. If growth is not accommodated in one specific area, it would likely be accommodated at another locale within the general area. Thus, the entire region needs to be considered when addressing population and housing.

A projection approach is used for the cumulative analysis of population and housing impacts as growth, land use change, and transportation network improvements across the region can substantially impact and modify population and housing by supporting and facilitating the addition or displacement of homes and population on a large scale. The cumulative impact is the combination of the impacts of the proposed Plan and impacts of population and housing impact projections identified in adopted plans. Significant cumulative impacts related to population and housing would occur if the proposed Plan and other planning documents would induce substantial increases in unplanned population growth or contribute to displacement of a substantial number of existing people or housing units which would necessitate the construction of replacement housing elsewhere.

This cumulative impact assessment considers and relies on the impact analysis within this EIR for the proposed Plan; SCAG 2020-2045 RTP/SCS EIR (SCAG 2020a); and the California-Baja California Border Master Plan (Caltrans 2021). Information on population forecasts and transportation network improvements was compiled

from the documents listed in Section 5.1. Table 5-1 shows these population forecasts for 2025, 2035, and 2050. Information on planned residential development and land use changes in Southern California is also available in adopted land use plans for individual cities and counties.

Impacts of the Proposed Plan

Implementation of regional growth and land use change and planned transportation network improvements would induce unplanned growth in some areas of the San Diego region in 2025, 2035, and 2050. This is considered a significant impact (Impact POP-1). By 2025, 2035, and 2050, the proposed Plan's regional growth and land use change would have the potential to displace a substantial number of residences, necessitating the construction of replacement housing elsewhere. Transportation network improvements, such as new rail extensions would also have the potential to displace a substantial number of people and existing housing units. As such, impacts related to the displacement of a substantial number of people and existing housing units, necessitating the construction of replacement elsewhere is significant in 2025, 2035, and 2050 (Impact POP-2).

Impact Projections in Adopted Plans

According to the EIR prepared for the SCAG 2020-2045 RTP/SCS, the proposed Plan would facilitate population growth in some areas of the SCAG region. It also found that transportation network improvements would displace a substantial number of existing homes due to ROW acquisitions. The 2020-2045 RTP/SCS would influence the pattern of growth in the region through transportation investments and land use strategies that would contribute to a cumulatively considerable increase in population outside the region. These impacts were found significant and unavoidable (SCAG 2020a).

The California-Baja California Border Master Plan is a binational comprehensive approach to coordinate planning and delivery of projects at land POEs and transportation infrastructure serving those POEs in the California-Baja California region. The projects included in the Master Plan would support and facilitate current and projected cross-border travel demand and economic activity as populations on both sides of the border are forecasted to increase. Thus, the Master Plan would induce population growth and economic development.

Adopted land use plans for local jurisdictions in Southern California and northern Baja would induce population growth through policy changes and zoning amendments that encourage and facilitate increased residential and employment growth. Some of this growth, particularly in currently built-out locations, would be driven by redevelopment in existing urban areas as communities increase their housing and commercial densities. For redevelopment to occur, existing housing and population would likely be displaced.

Cumulative Impacts and Impact Conclusions

2025

A cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan and impact projections from adopted plans within the Southern California and northern Baja region were significant when considered together, even if not independently significant. As described above, implementation of the regional growth and land use change as well as transportation network improvements associated with the proposed Plan would induce substantial unplanned population growth. Additionally, by 2025, regional growth and land use change would displace a substantial number of existing homes and population. In addition, population and housing impacts were also identified in other land use plans would contribute to substantial unplanned population growth and/or displacement of homes or population. The combination of the direct population and

housing impacts from the proposed Plan and these adopted plans would result in significant cumulative population and housing impacts in the Southern California and northern Baja region by 2025.

Because cumulative population and housing impacts throughout the Southern California and northern Baja region by 2025 would be significant, and because the proposed Plan's incremental impacts are significant, the proposed Plan's incremental population and housing impacts are also cumulatively considerable (Impact C-POP-1).

2035

As discussed in the 2025 analysis, implementation of the regional growth and land change as well as transportation network improvements associated with the proposed Plan by 2035 would induce substantial unplanned population growth and displace a substantial number of existing homes and population. In addition, population and housing impacts were also identified in other land use plans would contribute to substantial unplanned population growth and displacement of homes or population. The combination of the direct population and housing impacts from the proposed Plan and these adopted plans would result in significant cumulative population and housing impacts in the Southern California and northern Baja region by 2035.

Because cumulative population and housing impacts throughout the Southern California and northern Baja region by 2035 would be significant, and because the proposed Plan's incremental impacts are significant, the proposed Plan's incremental population and housing impacts are also cumulatively considerable (Impact C-POP-1).

2050

As discussed in the 2025 and 2035 analyses, implementation of the regional growth and land change as well as transportation network improvements associated with the proposed Plan would induce substantial unplanned population growth and displace a substantial number of existing homes and population. While the analysis of the SCAG 2020-2045 RTP/SCS does not extend to 2050, regional population growth and associated impacts would continue through this timeframe.

Although currently adopted land use plans rarely extend to 2050, infrastructure improvement projects, policy changes, and zoning amendments that support residential and employment growth would induce population growth beyond their timeframes. Policy changes and zoning amendments that allow and encourage higher-density residential and employment uses would likely continue to displace existing homes and population. The combination of the direct population and housing impacts from the proposed Plan and these projects and adopted plans would result in significant cumulative population and housing impacts in the Southern California and northern Baja region by 2050.

Because cumulative population and housing impacts throughout the Southern California and northern Baja region by 2050 would be significant, and because the proposed Plan's incremental impacts are significant, the proposed Plan's incremental population and housing impacts are also cumulatively considerable (Impact C-POP-1).

Mitigation Measures

C-POP-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO POPULATION AND HOUSING

Mitigation regarding inducement of substantial unplanned population growth by the proposed Plan was found to be infeasible. As described in Section 4.14, SANDAG has no control over the amount of growth the region would experience during the implementation of the proposed Plan. For the same reasons, mitigation to reduce population growth in Southern California and northern Baja would also be considered infeasible.

Section 4.14 of the proposed Plan includes mitigation measures **POP-2a** and **POP-2b**, which calls for project designs that reduce displacement. Even with implementation of mitigation, displacement impacts would be significant and unavoidable.

The SCAG 2020-2045 RTP/SCS EIR includes a similar mitigation measure as the proposed Plan to implement growth strategies and urban form design enhancing mobility and reducing land consumption. The SCAG 2020-2045 RTP/SCS EIR also includes measures to minimize displacement of homes and provide affordable housing (SCAG 2020a). These mitigation measures and design strategies would reduce impacts on the displacement of residences, but would not reduce impacts to less-than-significant levels. Displacement of homes and population from regional growth and land use changes would remain cumulatively considerable.

Therefore, the proposed Plan's incremental contributions to cumulative population and housing impacts in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

5.2.15 PUBLIC SERVICES AND UTILITIES

C-PS-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO PUBLIC SERVICES

C-U-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO UTILITIES

C-REC-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO RECREATIONAL RESOURCES

The area of geographic consideration for cumulative impacts on public services and utilities is Southern California and northern Baja. Public services and utilities are common infrastructure throughout the region, and land use change and the transportation system would influence the location and demand for future development new or additional services and utilities across the region. The provision of public services and utilities can be linked to jurisdictions, but often service providers cover large areas spanning multiple jurisdictional boundaries. Also, while some recreational facilities are local and serve only a small neighborhood, other recreational facilities provide opportunities for the population throughout the region. Thus, it is necessary to consider the region as a whole and the overall amount of development that would generate additional pressure and demand on services, utilities, and recreation facilities.

The projection approach for the analysis of cumulative public services and utility impacts allows for an overarching discussion of regional impacts associated with general patterns of regional urbanization, growth, and land use change that would create new or additional demand for services, utilities, and recreation facility use, or dictate where new or expanded infrastructure is located.

Growth, land use change, and transportation system improvements occurring throughout the Southern California and northern Baja region would impact public services and utilities. Significant cumulative impacts related to public services and utilities would occur if the combination of impacts from the proposed Plan and impact projections in adopted plans would cause a substantial physical deterioration of public facilities or

cause substantial adverse physical impacts associated with the provision of, or need for, new or physically altered public facilities to maintain adequate fire and police protection, schools, libraries, and recreation facilities; or result in the expansion or construction of wastewater treatment, storm water drainage, electricity/natural gas, or solid waste disposal facilities to adequately meet projected capacity needs or comply with regulations, the construction of which would cause significant environmental impacts

The plans considered and relied on for this cumulative analysis include the SCAG Regional Transportation Plan/ Sustainable Communities Strategy 2020-2045 and its EIR (SCAG 2020a). Additionally, public service or utility providers, including cities, counties, special districts, school districts, and utilities that operate in Southern California and northern Baja region, have adopted long-term plans that forecast the demand for services and identify specific facilities projects required to meet projected demand and needs.

Impacts of the Proposed Plan

Analysis in Section 4.15 of the proposed Plan describes how regional growth and land use change would increase demand for public services including fire and police protection, emergency services, schools, libraries, and recreational facilities. Section 4.15 also describes how the proposed Plan would increase demands on governmental facilities such as wastewater collection and treatment facilities, storm water drainage facilities, energy infrastructure, and solid waste facilities. This regional growth would require or result in the construction of new facilities or expansion of existing facilities, due to the higher levels of public service demand. This would result in short-term construction-related impacts, as well as operational impacts, to resources such as air quality, noise, and traffic. These impacts are typically reduced through actions of the implementing agency, including adherence to existing regulations and BMPs, but are considered significant because impact mitigation to less-than-significant levels for all projects cannot be guaranteed. Therefore, as described in Section 4.15, public service and utilities impacts due to the regional growth and land use change in the proposed Plan are significant in 2025, 2035, and 2050 (Impact PS-1) (impacts related to construction of new or expanded solid waste facilities are less than significant in 2025).

Implementation of transportation network improvements would require minor use of public services and utilities and would generally not cause substantial deterioration or the need for new facilities. However, transportation network improvements associated with the proposed Plan would contribute to substantial adverse physical impacts associated with the construction of new or expanded storm water facilities in 2025, 2035, and 2050 (Impact U-1) and also in substantial adverse physical impacts associated with the construction of new or expanded solid waste facilities in 2035 and 2050 (Impact U-2).

Implementation of regional growth and land use changes, as well as transportation network improvements, would result in increased demand for recreation facilities leading to accelerated deterioration and contribute to the physical removal of open space park and recreation lands. The proposed Plan would result in the removal of 988 acres of open space park and recreation lands in 2025, 1,512 acres by 2035, and 1,585 acres by 2050. Collectively, these impacts (Impact REC-1) would result in the substantial physical deterioration of existing park and recreation facilities and adverse physical impacts related to future facility expansions.

Impacts of Related Projects

Projects planned in the Southern California region, such as the Navy OTC Revitalization Project, border/POE facility improvements, airport expansions in the San Diego region**,** or port/maritime improvements associated with the Port Master Plan Update, would result in impacts related to increased demand for governmental utilities such as wastewater collection and treatment facilities, storm water drainage facilities, energy

infrastructure and solid waste facilities. This regional growth would require or result in the construction of new facilities or expansion of existing facilities, due to the higher levels of public service demand. For example, the EIS for the Navy OTC Revitalization Project determined that the project would result in increased density under several alternative options that would contribute to significant additional proposed growth in dwelling units, population, jobs, and non-residential uses over the targets contained in the applicable community plan. The project would require approximately 37 additional teachers, 11 new police officers, 9 additional emergency personnel and five new library employees by 2050 to accommodate the estimated increase in population from development. An additional 40.2 acres of parkland would be required to meet the city's population- based standard for parkland if the property were to transfer out of federal ownership.

Impact Projections in Adopted Plans

The County of San Diego General Plan EIR identified significant impacts on public services and utilities associated with the construction or expansion of police protection facilities, expansion of school facilities, and library facilities. Regionally, cumulatively considerable impacts on public services and utilities would result from implementation of the County of San Diego General Plan Update (County of San Diego 2011).

The SCAG Regional Transportation Plan/ Sustainable Communities Strategy 2020-2045 analyzes impacts on the SCAG region up to 2045 and found that even with implementation of identified mitigation measures, significant impacts on public services would result due to the considerable effects to the cumulative staffing level and response times of police, fire, and emergency services in Southern California; direct and cumulative demand for school facilities; loss of open space and recreational lands; demand on existing recreational facilities; and direct and cumulative demand for solid waste services in the SCAG region (SCAG 2020a). Thus, regionally cumulatively considerable impacts on public services and utilities would result from implementation of the SCAG 2020-2045 RTP/SCS.

Throughout Southern California, individual cities and counties have also adopted general plans that guide growth and land use changes within their jurisdictions. Moreover, individual service providers, including cities, counties, special districts, school districts, and utilities, that operate in the Southern California region have adopted long-term plans that forecast the demand for services and identify specific facilities projects that will be required to meet projected needs. Each individual service provider, including cities, counties, special districts, school districts, and utilities, that has an adopted general plan or other long-term plan that forecasts the demand for services and identifies projects that will be required to meet projected needs, is responsible for conducting the appropriate environmental assessment, identifying impacts, and implementing mitigation measures to reduce impacts when possible. Construction-related and operational impacts are typically reduced through actions of the implementing agency, including adherence to existing regulations and BMPs, but are considered significant because impact mitigation to less-than-significant levels for all projects cannot be guaranteed.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combination of impacts of the proposed Plan and impact projections from adopted plans within the Southern California region are significant when considered together, even if not independently significant. Impacts from construction and of expanded or new facilities for public services, utilities, and recreational resources from the proposed Plan and adopted plans in the Southern California region would be cumulatively significant in 2025. Because cumulative public services

and utilities impacts throughout the Southern California region by 2025 would be significant, and because the proposed Plan's incremental impacts are significant, the proposed Plan's incremental public services and utilities impacts are also cumulatively considerable, with the exception of impacts related to provision of new or expanded solid waste facilities (Impact C-PS-1, Impact C-U-1, and Impact C-REC-1).

As described in Section 4.15, there is sufficient landfill capacity in the region to accommodate forecasted regional growth at least through 2030. As a result, the proposed Plan would not generate solid waste at a level that would require new or expanded solid waste disposal facilities. The State of California continues to pass legislation in support of additional recycling requirements with an emphasis on increasing organic material diversion and developing the necessary organics processing infrastructure. While cumulative demand in the Southern California region for solid waste disposal would increase by 2025, there is sufficient capacity for solid waste disposal in the San Diego region through 2025. Therefore, the cumulative solid waste impact is not significant, and the proposed Plan's less-than-significant impacts related to solid waste disposal are not cumulatively considerable in 2025.

2035

As described above, impacts from construction of expanded or new facilities for public services and utilities from the proposed Plan and adopted plans in the Southern California region would be cumulatively significant in 2035. Because cumulative public services and utilities impacts, including solid waste, and recreational resources throughout the Southern California region by 2035 would be significant, and because the proposed Plan's incremental impacts are significant, the proposed Plan's incremental public services and utilities impacts are also cumulatively considerable (Impact C-PS-1, Impact C-U-1, and Impact C-REC-1).

2050

While many regional plans or projection impacts do not extend until the year 2050, public service and utility impacts, similar in nature to those identified for earlier years would likely persist and also occur in 2050. As described above, impacts from construction and of expanded or new facilities for public services, utilities, and recreational resources from the proposed Plan and adopted plans in the Southern California, including solid waste, would be cumulatively significant in 2050. Because cumulative public services and utilities impacts throughout the Southern California region by 2050 would be significant, and because the proposed Plan's incremental impacts are significant, the proposed Plan's incremental public services and utilities impacts are also cumulatively considerable (Impact C-PS-1, Impact C-U-1, and Impact C-REC-1).

Mitigation Measures

C-PS-1 **MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO PUBLIC SERVICES**

C-U-1 **MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO UTILITIES**

C-REC-1 **MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO RECREATIONAL RESOURCES**

Mitigation measures to reduce impacts associated with public services and utilities as identified in Section 4.15 would be applicable to cumulative impacts as well.

Section 4.15 includes mitigation measures **PS-1**, **REC-1**, **U-1a**, and **U-1b**, which call for jurisdictions with responsibility for construction of public facilities, recreation facilities, wastewater treatment facilities, or storm water facilities to apply mitigation measures to avoid or reduce significant environmental impacts associated with the construction or expansion of such facilities. Section 4.15 also references mitigation measure WS-1a from Section 4.17 regarding the reduction of water use for construction and operation of projects to conserve water. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level.

Mitigation measure **U-2a** calls for the reduction of impacts from construction or expansion of solid waste facilities, and mitigation measures **U-2b** and **U-2c** would reduce solid waste volumes that would require accommodation in regional landfills through the diversion of construction waste from transportation network improvement projects or other development projects and the implementation of green building waste management measures. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level.

Similarly, the SCAG 2020-2045 RTP/SCS EIR included mitigation measures to reduce impacts on public services, such as coordination with emergency service providers, avoidance and conservation of recreation and open space areas, patterns of urban development and land use that reduce costs on infrastructure and make better use of existing facilities green building measures, source reduction and recycling for construction projects, and waste management strategies. However, even with the implementation of mitigation measures, the EIR concluded that significant and unavoidable public service impacts would result.

Based on the above analysis, the proposed Plan's incremental contributions to cumulative public services and utilities impacts in years 2025, 2035, and 2050 would remain significant and cumulatively considerable post-mitigation.

5.2.16 TRANSPORTATION

C-TRA-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS TO TRANSPORTATION

The geographic scope for the transportation cumulative analysis is the Southern California and northern Baja region. Urban development and transportation systems are not bound by jurisdictional boundaries as movement within, through, and beyond the region is necessary for commuters, personal travel, and goods movement. Thus, it is important to consider both the Southern California region as well as the connection with northern Baja California. [1]

A hybrid approach for the cumulative analysis of transportation allows for an overarching discussion of regional impacts associated with general patterns of regional urbanization, growth, and land use change and how the transportation network both influences, and is affected by, those regional development patterns. Discussion of specific large-scale existing and probable future projects will also allow for consideration of individual projects with known impacts on traffic and transportation.

Cumulative impacts related to transportation would occur if future operating conditions of the regional transportation system, including the SANDAG, SCAG, and northern Baja regions, conflict with a program, plan,

[1] It should be noted that the SANDAG model only calculates VMT within the San Diego region.

ordinance or policy addressing the circulation system; conflict with CEQA Guidelines Section 15064.3 by not achieving the substantial VMT reductions needed to help achieve statewide GHG reduction goals; substantially increase hazards due to design features; or result in loss of parking that causes significant adverse environmental impacts not evaluated elsewhere in the EIR.

This cumulative impact assessment relies on the impact analysis within this EIR for the proposed Plan; SCAG 2020-2045 RTP/SCS EIR (SCAG 2020); SCAG 2021 Federal Transportation Improvement Program (SCAG 2021); San Diego County Regional Airport Authority 2008 Airport Master Plan, San Diego International Airport and associated EIR (SDCRAA 2008); SDCRAA Aviation Activity Forecast (SDCRAA 2019); SDCRAA Regional Aviation Strategic Plan Update (SDCRAA 2011b); Border 2025 Program, Master Action Plan for California-Baja California (EPA 2013); California-Baja California Border Master Plan (Caltrans 2008); and 2034 Tijuana, Tecate, and Playas de Rosarito Metropolitan Strategic Plan (IMPLAN 2013).

Impacts of the Proposed Plan

Implementation of regional growth and land use change as well as transportation network improvements associated with the proposed Plan would not conflict with a program, plan, ordinance or policy addressing the circulation system in 2025, 2035, or 2050. As documented in Section 4.16, the proposed Plan would increase multi-modal options, including bicycle, pedestrian, and transit trips within the region, in all years, while reducing vehicle trips, which would be consistent with the policies outlined in the 2019 Federal RTP. In addition, the proposed Plan would not result in hazardous design features because transportation network improvements would be designed in accordance with existing standards. Nor would the proposed Plan result in loss of parking that causes significant adverse environmental impacts not evaluated elsewhere in the EIR . These impacts would be less than significant in 2025, 2035, and 2050 (Impacts TRA-1, TRA-3, and TRA-4).

However, while implementation of the proposed Plan would result in a decrease in the region's VMT per capita, it will not be enough to achieve the state's VMT reduction goal of 14.3 percent below baseline year 2016 conditions. Additionally, the proposed project would result in substantial increase in the overall VMT generated by the region. Therefore, this would result in a significant impact in 2025, 2035 and 2050 conditions (Impact TRA-2).

Impacts of Related Projects

Related infrastructure projects, such as the HST, would result in potentially significant transportation impacts. The environmental document for the HST project found that the project would have a positive effect when viewed on a system-wide basis, particularly by reducing traffic on highways and around airports to the extent that intercity trips are diverted to the train system and by eliminating delays at existing at-grade crossings where the train system would provide grade separation. However, localized traffic conditions around some HST system stations would experience a decrease in level of service and some added delays, and transit lines serving the stations areas would experience increases in passengers during peak hours.

The Airport Development Plan would include improvements at SDIA in order to continue to accommodate the approximately 1.82 million passengers that travel through SDIA each year. Improvements would include replacement of the existing Terminal 1, modifications to Terminal 2, a new administration building, and a new airport access roadway with new bicycle and pedestrian infrastructure. The recirculated EIR for the Airport Development Plan concluded that implementation of the plan would result in significant and unavoidable traffic impacts (SDCRAA 2019).

Recent cross-border and POE projects have been completed along the U.S./Mexico border including the San Diego-Tijuana Airport Cross Border Facility, which opened in 2015, and the San Ysidro Port of Entry Expansion Project, the last phase of which opened in December 2019. The Cross Border Facility project involved creation of a POE limited to pedestrian toll-paying airline passengers, avoiding and reducing delays at the San Ysidro and Otay Mesa POEs. The EIR for this project found that project's contribution to significant buildout transportation/circulation impacts would be cumulatively considerable and would remain significant after implementation of the identified mitigation (City of San Diego 2011). The San Ysidro Expansion Project that would provide additional pedestrian and vehicle lanes and capacity through the POE to reduce traffic delays.

Impact Projections in Adopted Plans

The EIR prepared for the 2020-2045 SCAG RTP/SCS identified a significant and unavoidable impact regarding conflicts or inconsistencies with CEQA Guidelines Section 15064.3(b) due to the potential to increase total daily VMT in 2045. The EIR also found a significant cumulative impact resulting from implementation of the 2020-2045 SCAG RTP/SCS to a cumulatively considerable amount of transportation impacts, such as VMT, in areas outside of the SCAG region (SCAG 2020). The SCAG 2021 FTIP is prepared to implement projects and programs listed in the RTP and is developed in compliance with state and federal requirements (SCAG 2021).

The 2008 Airport Master Plan, San Diego International Airport EIR identified that all traffic-related impacts related to implementation of the Airport Master Plan would be reduced to less than significant with mitigation. However, the SDCRAA lacks the legal authority to implement the identified mitigation measures as the roadway segments, intersections, and freeway ramps are within the responsibility and jurisdiction of other agencies; thus, if the agencies do not implement the measures identified in the EIR, the traffic impacts would remain significant. The EIR analyzed parking supply and did not identify significant parking impacts related to implementation of the plan or alternatives (SDCRAA 2008).

The SDCRAA Aviation Activity Forecast Update updated the 2012 forecasts for current and future capacity of the County's existing single runway and projected passenger traffic, aircraft operations, cargo activity, general aviation, and military operations through the year 2050 (SDCRAA 2019). The updated forecasts were prepared to analyze the factors behind the faster than forecast growth than what was anticipated in the 2012 forecasts. The 2012 forecasts found that, by 2021 through 2035, runway congestion will not allow further growth and that the single runway does not have enough capacity to handle the forecasted growth in aircraft operations; the airport will experience a cumulative loss of at least five million to as many as 31 million passengers over the forecast period (SDCRAA 2004). The RASP was prepared by SDCRAA to assess the long-range capabilities of all public-use airports in the county with the goal of improving the performance of the regional airport system (SDCAA 2011).

The Border 2025 Program, Master Action Plan for California-Baja California includes objectives to reduce air emissions with one action to reduce vehicle emissions in the border region by establishing or strengthening programs that reduce the number of vehicles that do not comply with vehicle emissions standards (EPA 2021). In addition, the 2034 Tijuana, Tecate, and Playas de Rosarito Metropolitan Strategic Plan states that a critical issue for the Baja region is the progressive deterioration of the quality of air associated with the number of vehicles and no provision of sustainable transportation (IMPLAN 2013). While there is no associated environmental documentation for these plans, the actions to improve air quality through better traffic operations and opportunities would benefit regional border transportation issues.

According to the California-Baja California Border Master Plan, approximately 16.6 million northbound pedestrian crossings and more than 30 million northbound privately owned vehicle crossings in 2015.

Projections for the year 2040 estimate a growth of approximately 68 percent for northbound crossings and the Master Plan addresses concerns and benefits related to border planning. The Master Plan does not have associated environmental analysis documents. The Master Plan concludes that the expansion of residents in the border region will increase cross-border travel demand and continue to add pressure to the POE facilities and connecting roads. Given the current and projected travel demand at the existing POEs, improving the capacity and operations of the current infrastructure is critical to decrease traffic congestion and delays, facilitate international trade, and improve the quality of life for residents in the border region (Caltrans 2021).

Cumulative Impacts and Impact Conclusions

2025

As described in Section 4.16, implementation of the proposed Plan in 2025 would result in a significant impact because of an increase in daily VMT within the San Diego region and because the proposed Plan would only achieve a decrease in VMT per capita of 7.2 percent below 2016 conditions, which falls short of the 14.3 reduction CARB estimates will be needed to achieve 2050 state climate goals. Other transportation-related impacts would be less than significant. As detailed in the sections above, there are forecasted adverse direct and cumulative traffic and transportation impacts that would result with the implementation of regional plans and related projects. For example, the SCAG 2020-2045 RTP/SCS EIR identified a significant cumulative impact resulting from a considerable contribution to impacts, such as VMT, in areas outside of the SCAG region (SCAG 2020). Therefore, cumulative transportation impacts throughout the Southern California and northern Baja region by 2025 would be significant due to implementation of regional plans and related projects, and the proposed Plan's contribution to VMT impacts would be cumulatively considerable (Impact C-TRA-1) .

2035

As described in Section 4.16, implementation of the proposed Plan in 2035 would result in a significant impact because of increased total annual VMT and the regional VMT per capita would not be reduced to the levels that are required to meet the state's GHG reduction goals. As detailed in the sections above, there are forecasted adverse direct and cumulative traffic and transportation impacts such as VMT that would result with the anticipated implementation of regional plans and related projects including the 2020-2045 SCAG RTP/SCS.

Because implementation of regional growth and land use change as well as transportation network improvements associated with the proposed Plan would not achieve the substantial VMT reductions needed to help achieve statewide GHG reduction goals and would result in a significant cumulative impact, in combination with other cumulative traffic impacts occurring throughout the region, the traffic impact of increased total annual miles traveled is cumulatively considerable in 2035 (Impact C-TRA-1).

2050

As described in Section 4.16, implementation of the proposed Plan in 2050 would result in a significant impact because of increased total annual VMT and the regional VMT per capita would not be reduced to the levels that are required to meet the state's GHG reduction goals. As detailed in the sections above, there are forecasted adverse direct and cumulative traffic and transportation impacts such as VMT that would result with the anticipated implementation of regional plans and related projects including the 2020-2045 SCAG RTP/SCS, (whose VMT effects would extend into 2050).

Because implementation of regional growth and land use change as well as transportation network improvements associated with the proposed Plan would not achieve the substantial VMT reductions needed to

help achieve statewide GHG reduction goals and would result in a significant cumulative impact, in combination with other cumulative traffic impacts occurring throughout the region, the traffic impact of increased total annual miles traveled is cumulatively considerable in 2050 (Impact C-TRA-1). .

Mitigation Measures

C-TRA-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS TO TRANSPORTATION

As detailed in Section 4.16, many features currently included in the proposed Plan (e.g., the SCS, increased transit and active transportation investments) have the effect of reducing total annual VMT that might not otherwise occur. Mitigation measure **TRA-2** would further reduce total VMT through implementation of transportation demand management strategies, reducing parking minimums, implementing additional active transportation facilities not identified in the proposed Plan (i.e., complete street investments and bicycle and pedestrian facilities), and implementation of road diet and traffic calming measures. In addition, GHG mitigation measures **GHG-5a**, **GHG-5d**, and **GHG-5f** include additional feasible VMT reduction measures not included in the proposed Plan that SANDAG would or other agencies can and should implement.

However, these mitigation measures would not reduce this impact to a less-than-significant level. Based on the above analysis and lack of further feasible mitigation, the proposed Plan's incremental contributions to cumulative transportation impacts in years 2020, 2035, and 2050 would remain significant and cumulatively considerable post-mitigation.

5.2.17 TRIBAL CULTURAL RESOURCES

C-TCR-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS TO TRIBAL CULTURAL RESOURCES

The area of geographic consideration for cumulative impacts on tribal cultural resources is the Southern California and northern Baja California region. Because local and regional settlement patterns are closely linked, it is important to evaluate the loss of tribal cultural resources across this entire geographic area to adequately consider how the loss of resources would impact the understanding of the closely interrelated prehistoric and historic context. A projection approach for cumulative analysis of tribal cultural resources allows for an overarching discussion of regional loss of interrelated tribal cultural resources associated with general patterns of regional urbanization, growth, and land use changes. The cumulative impact is the combination of the impacts of the proposed Plan and impact projections in adopted planning documents. Significant cumulative impacts related to tribal cultural resources would occur if cumulatively there would be a substantial increase in impacts with regard to the significance of tribal cultural resources.

This cumulative impact assessment considers and relies on the impact analysis within this EIR for the proposed Plan, SCAG's Connect SoCal (2020-2045 Regional Transportation Plan/Sustainable Communities Strategy EIR (SCAG 2020) for the Southern California region, the County of San Diego General Plan Update EIR (County of San Diego 2011), and the California-Baja California 2021 Border Master Plan (Caltrans 2021). Many local jurisdictions provide guidance and protective measures for tribal cultural resources in their general plans and other local planning documents. There are generally no regional plans pertaining to such resources for the northern Baja California region. The California-Baja California Border Master Plan is a binational comprehensive approach to coordinate planning and delivery of projects at land POEs and transportation infrastructure serving those POEs in the California-Baja California region. The Master Plan does not have an

associated environmental analysis documents and no detailed analysis of cultural resource impacts was conducted for this Master Plan (Caltrans 2021).

Impacts of the Proposed Plan

Areas in the San Diego region are known to have a high potential for tribal cultural resources. Implementation of the proposed Plan would result in the construction of development projects and transportation network improvements that would result in a wide range of construction and ground-disturbing activities, such as excavation, grading, and clearing, which remove and/or disturb the upper layer of soils. Since tribal cultural resources have been found within inches of the ground surface in some areas of the San Diego region, in some locations these ground-disturbing activities would cause a substantial adverse change in the significance of a tribal cultural resource. Implementation of the proposed Plan would necessitate construction activities that in some locations would cause a substantial adverse change in the significance of a tribal cultural resource through the physical demolition, destruction, relocation, or alteration of a resource or its immediate surroundings such that the significance of a tribal cultural resource would be materially impaired. This would occur within each horizon year analyzed (2025, 2035, and 2050). Therefore, impacts related to a substantial adverse change in the significance of a tribal cultural resource would be significant (Impact TCR-1).

Impacts of Related Projects

Projects planned in the Southern California region, such as the Navy OTC Revitalization Project, SDIA Airport Development Plan, HST, and City of San Diego Pure Water North City, would result in impacts related to destruction or alteration of tribal cultural resources. Other land development and infrastructure projects throughout the region, such as transportation infrastructure, energy generation and transmission corridors, and commercial and residential land development would also result in impacts if these projects occur in areas containing significant tribal cultural resources.

For example, the HST project in the San Diego region would result in construction of track, bridges and elevated guideways, stations, and other features that may result in destruction or alteration of tribal cultural resources, referred to in the program EIR/EIR as traditional cultural properties (HSRA 2005). The EIR/EIS prepared for the HST project determined that the project would result in significant cumulative impacts on traditional cultural properties. The EIR for the SDIA Airport Development Plan did not identify significant impacts to tribal cultural resources (SDCRAA 2019). The Navy Old Town Campus Revitalization Project would result in impacts, to tribal cultural resources however, impacts would be mitigated to a level of less than significant respect. Impacts would similarly be cumulatively considerable, if these projects occur in close proximity to one another. The City of San Diego Pure Water North City Project did not identify cumulatively considerable impacts to tribal cultural resources, which are referred to in the EIR as locations of “religious or sacred use”.

Impact Projections in Adopted Plans

Implementation of the 2020-2045 RTP/SCS would result in significant and unavoidable impacts related to adverse changes in the significance of tribal cultural resources. In addition, the 2020-2045 RTP/SCS’s influence on growth would contribute to regionally significant impacts on tribal cultural resources and be cumulatively considerable (SCAG 2020). The EIR prepared for the County of San Diego General Plan Update did not explicitly analyze impacts on tribal cultural resources; however, the EIR considers impacts on tribal archaeological resources and identifies mitigation consistent with the requirement of SB 18 related to regional coordination and consultation with local tribal governments. The California-Baja California Border Master Plan does not provide analysis of impacts on cultural resources; however, projects included in the Master Plan could have

adverse impacts on cultural or paleontological resources due to ground disturbance necessary for construction of infrastructure.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan, related projects, and impact projections from adopted plans within the Southern California and northern Baja region are significant when considered together, even if not independently significant. As described above, implementation of the proposed Plan and other regional plans would result in ground-disturbing activities that would cause a substantial adverse change in the significance of a tribal cultural resource. California projects are required to adhere to federal, state and local regulations, as described in Section 4.5; however, cumulative growth development located in Mexico would not be subject to compliance with such regulations. Additionally, even with regulations in place, individual tribal cultural resources could still be impacted or degraded from demolition, destruction, alteration, or structural relocation as a result of new private or public development or redevelopment allowable under the proposed plan or other adopted regional plans. Therefore, cumulative impacts on tribal cultural resources would be significant. Because the proposed Plan's impacts on tribal cultural resources are significant, they are also cumulatively considerable in 2025 (Impact C-TCR-1).

2035

The cumulative analysis presented above for the horizon year of 2025 would be applicable to year 2035, and significant cumulative impacts on tribal cultural resources would occur. By 2035, increases in regional growth and land use change, and the number of transportation network improvements implemented over those that occurred by 2025 would result in additional adverse impacts related to changes in the significance of a tribal cultural resource. As described in the 2025 analysis, cumulative impacts on tribal cultural resources would be significant because there would be cumulative adverse changes in the significance of those resources due to the proposed Plan, and other regional plans, and development located in northern Baja California. Because cumulative tribal cultural resource impacts throughout the Southern California and northern Baja region by 2035 would be significant, and because the proposed Plan's incremental impacts are significant, the proposed Plan's incremental tribal cultural resource impacts are also cumulatively considerable (Impact C-TCR-1).

2050

The cumulative analysis presented above for the horizon years of 2025 and 2035 would be applicable to year 2050, and significant cumulative impacts on tribal cultural resources would occur. By 2050, increases in regional growth and land use change, and the number of transportation network improvements implemented over those that occurred by 2025 and 2035 would result in adverse impacts related to changes in the significance of a tribal cultural resource.

As described in the 2025 analysis, cumulative impacts on tribal cultural resources would be significant because there would be cumulative adverse changes in the significance of those resources due to the proposed Plan, and other regional plans, and development located in northern Baja California. Because the proposed Plan's impacts on tribal cultural resources are significant, they are also cumulatively considerable in 2050 (Impact C-TCR-1).

Mitigation Measures

C-TCR-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS TO TRIBAL CULTURAL RESOURCES

Mitigation measures to reduce impacts on tribal cultural resources due to implementation of the proposed Plan as identified in Section 4.17 would be applicable to cumulative impacts as well.

Mitigation measures **TCR-1a** and **TCR-1b** are measures to avoid or substantially reduce adverse changes in the significance of a cultural resource, and protect cultural resources. These mitigation measures also require the implementation of monitoring and data recovery programs during construction. These mitigation measures would be included in project-level planning, design, and CEQA reviews. Implementation of these mitigation measures would not reduce impacts that would cause a substantial adverse change in the significance of a tribal cultural resource to less than significant because it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Mitigation measures **TCR-1a** and **TCR-1b** would not reduce the proposed Plan's incremental impacts to less than significant. Therefore, the proposed Plan's incremental contributions to cumulative tribal cultural resources impacts in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

5.2.18 WATER SUPPLY

C-WS-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS TO WATER SUPPLY

The geographic scope for the water supply cumulative analysis is the state of California, the Lower Colorado River Basin, and northern Baja California. The large geographic scope is appropriate because regional growth and land use change, transportation system needs, and the resulting water demand can influence water supply reliability across the region as a whole, as development and water supplies are not strictly characterized by jurisdictional boundaries.

The projection approach for the cumulative analysis of water supply is used. A projection approach allows for an overarching discussion of regional impacts associated with water supply if existing water supplies and facilities were not adequate for projected regional demand or if general patterns of regional urbanization, growth, and land use changes and infrastructure development would result in the need for new or expanded water treatment and distribution facilities.

The plans and studies relied on and considered for the cumulative analysis include the SCAG 2020–2045 RTP/SCS and its EIR (SCAG 2020a; 2020b), the San Diego County Water Authority (SDCWA), 2013 Regional Water Facilities Optimization and Master Plan Update (SDCWA 2014), Water Supply for Baja California: Economic – Engineering Analysis for Agricultural, Environmental and Urban Demands (Medellin-Azuara et al. 2009), California Water Action Plan (California Natural Resources Agency 2014), California Water Plan Update 2013 (California Department of Water Resources 2013), SDCWA's 2020 Urban Water Management Plan (SDCWA 2021), Metropolitan Water District of Southern California's 2020 Regional Urban Water Management Plan (Metropolitan Water District of Southern California 2021), Municipal Water District of Orange County's (MWDOC) Draft 2020 Regional Urban Water Management Plan (Municipal Water District of Orange County 2021), Imperial Irrigation District's 2012 Integrated Regional Water Management Plan (IID 2012), 2034 Tijuana, Tecate, and Playas de Rosarito Metropolitan Strategic Plan (IMPLAN 2013), Colorado River Basin Water Supply and Demand Study (Bureau of Reclamation 2012), and Lower Colorado River Interim Shortage

Criteria and associated EIS (Bureau of Reclamation 2007). While many of these documents do not have accompanying environmental analysis, they provide valuable information regarding the current and future status of water supply throughout the cumulative region.

Within the geographic scope of the analysis are three groundwater basins designated by the state as medium priority and one basin designated as high priority pursuant to the SGMA. Preparation of GSPs for the medium-priority basins to allow future maintenance of a sustainable yield from these basins is underway should be completed by 2022. A GSP has been prepared for the high-priority basin, the Borrego Valley Groundwater Subbasin, by the Borrego Valley Groundwater Sustainability Agency (BVGSA). The Borrego Springs GSP establishes a sustainability goal to halt the overdraft condition in the Subbasin by bringing the groundwater demand in line with a sustainable yield of 5,700 acre-feet per year by 2040 (BVGSA 2019). A Settlement Agreement to adjudicate groundwater rights in a manner consistent with the GSP was approved on April 8, 2021 (see *Borrego Water District v. All Persons who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin No. 7.024-01*) [Superior Court of the State of California, County of Orange 2021].

The County of San Diego in the most recent General Plan Update (County of San Diego 2011) examined groundwater basins and fractured rock aquifers across the County to determine which were being exploited in an unsustainable manner as evidenced by insufficient aquifer recovery.

Significant cumulative impacts related to water supply would occur if existing water supplies and facilities were not adequate to serve cumulative growth such that new or expanded water supplies or entitlements would be required, if cumulative growth would impact groundwater resources in a manner that would hinder sustainable use, or if cumulative growth and infrastructure development resulted in construction of new or expanded water facilities that would cause significant environmental impacts.

Impacts of the Proposed Plan

Reasonably foreseeable existing and future regional water supplies would be adequate to meet regional water demands associated with growth and land use change and transportation network improvements in 2025 and 2035. Beyond 2045, however, adequate water supplies to meet regional needs cannot be confirmed. This uncertainty means that there may be insufficient regional water supplies in 2050, resulting in a significant impact (Impact WS-1). Also, there would be localized significant impacts because of regional development and land use changes within the boundaries of groundwater basins that are currently being pumped at unsustainable levels. Proposed Plan impacts associated with groundwater water supplies in 2025, 2035, and 2050 are significant. (Impact WS-2).

Also, in 2025, 2035, and 2050, forecasted growth and land use change and implementation of transportation network improvements would require construction of new water facilities or the expansion of existing facilities; impacts of constructing these facilities would be significant (Impact WS-3).

Impact Projections in Adopted Plans

While a majority of the documents and plans available for cumulative analysis do not have associated environmental analysis, they do provide anticipated water supply demand for the region and consider the adequacy of their existing supplies and plans for future supplies to meet future needs. These regional plans also offer resource management strategies and objectives for ensuring future water supply such as reduce water demand, improve operational efficiencies, increase and diversify water supply, and provide resource stewardship. Due to current drought conditions throughout the state of California, many water districts and

other water suppliers have implemented a variety of drought responses that could influence the availability of water supplies and water deliveries as previously anticipated in local and regional plans.

The SCAG 2020-2045 RTP/SCS EIR (SCAG 2020b) found that the 2020-2045 RTP's influence on growth would contribute to an increased demand for water supply and its associated infrastructure. The EIR also identified the potential of the 2020-2045 RTP/SCS to contribute to cumulatively considerable demand on water resources. Further, the increased demand resulting from the proposed Plan's influence on growth could only be even partially mitigated via measures beyond the purview of SCAG to implement, meaning that potentially significant water supply impacts would result.

As described in a paper titled, Water Supply for Baja California: Economic – Engineering Analysis for Agricultural, Environmental and Urban Demands, agricultural operations and population growth in California-Baja California has placed pressure on natural resources, particularly water supply. It is of significant concern to the California-Baja California border, where 50 percent of the entire U.S./Mexico border population lives. The conditions of northern Baja region of arid climate, prominent agriculture, fast-growing border cities, and water-sensitive ecosystems indicate that future water supplies will be a problem (Medellin-Azuara et al. 2009).

SDCWA's 2020 Urban Water Management Plan reports that, for normal years through 2045, no water supply shortages would occur if supplies are developed as planned. Under the parameters assumed in the multiple dry-year analysis no shortages would be experienced. Diversified supplies, consisting of water transfer agreements, local surface water, desalination, and entitlements to MWD supplies assure adequate water even during drought cycles through 2045. After 2045 there are no projections (SDCWA 2021).

The County General Plan Update EIR determined that groundwater basins and fractured rock aquifers in the County were currently being pumped at levels that resulted in insufficient water level recovery. Such use is unsustainable over time and is a significant impact to the groundwater resources.

The focus of the SDCWA's 2013 Regional Water Facilities Optimization and Master Plan was to optimize existing infrastructure and maintain the flexibility to adjust to a range of future regional planning outcomes through 2035. The update continued to find that the existing aqueduct system is fully capable of meeting regional demands through the mid-2020s and under normal and wet weather patterns, there is a very low occurrence of supply-demand gaps through 2035. However, during multiple dry-year weather patterns, the 2013 Regional Water Facilities Optimization and Master Plan Update identified that supply-demands gaps will likely occur (SDCWA 2014).

Metropolitan's 2020 Regional Urban Water Management Plan reports that Metropolitan has supply capabilities that would be sufficient to meet projected demands from 2020 through 2045 under the single dry-year and multiple dry-year conditions (2021). There are no projections post-2045.

The MWDOC Draft 2020 Regional Urban Water Management Plan (MWDOC 2021) concludes that the MWDOC service area (the region served by MWDOC is in Orange County and includes 26 cities and water districts) will have sufficient existing and planned supplies to meet full service demands under every water-year hydrologic scenario through 2045 by depending on MWD deliveries to compensate for any local shortfalls. The plan also discusses potential sources of water supply that are being investigated to diversify the region's water supply portfolio, such as water transfers and exchange and ocean water desalination (MWDOC 2021).

IID's 2012 Integrated Regional Water Management Plan states that the Imperial Region is faced with significant water resources challenges, most of which relate to the availability of imported water from the Colorado River.

System and on-farm efficiency conservation measures have been formulated to enable IID to meet the reduction requirement of net annual consumptive use of Colorado River water by 408,000 acre-feet by 2026. These measures are designed to maintain historic levels of agricultural productivity and MCI water supplies; however, when forecasted renewable energy and other demands are added to the future demand, the historic amount would no longer be sufficient (IID 2012).

The Colorado River Basin Water Supply and Demand Study found that the Colorado River Basin faces a range of potential future imbalances between supply and demand and states that addressing such imbalances will require diligent planning and cannot be resolved through any single approach or option. Instead, an approach that applies a wide variety of ideas at local, state, regional, and portfolio exploration demonstrated that implementation of a broad range of options can reduce Basin resource vulnerability and improve the system's resiliency to dry hydrologic conditions while meeting increasing demands in the Basin and adjacent areas receiving Colorado River water (Bureau of Reclamation 2012).

The 2034 Tijuana, Tecate, and Playas de Rosarito Metropolitan Strategic Plan lists the low water availability in the region as a critical environmental issue, which is a limiting factor for future development. The plan states that water demand in 2025 will be greater than 80 percent of the available water reserves. Strategies for improvement listed in the plan include promote investment to ensure capacity of reuse and infiltration of treated water and install sea water desalination plants (IMPLAN 2013).

The Lower Colorado River Interim Shortage Criteria and associated EIS (Bureau of Reclamation 2007) represent a plan to share water supply shortages among Lower Colorado River water users, including SDCWA. The EIS prepared for the interim shortage criteria projects Lower Colorado River water supply and demand conditions through 2050. It also analyzes and considers trade-offs between the frequency and magnitude of shortages, and describes potential effects on water shortage in Lake Powell and Lake Mead, and on water supplies, power production, recreation, and other environmental resources. Ongoing drought conditions and the potential for water supply shortages prompted discussions and negotiations focused on how to conserve additional basin water supplies. After several years of negotiations, on March 19, 2019, Reclamation and the Colorado River Basin states finalized Drought Contingency Plans (DCPs) for both the Upper Basin and the Lower Basin. The Lower Basin DCP is designed to require Arizona, California, and Nevada to curtail deliveries and thereby contribute additional water to Lake Mead storage at predetermined "trigger" elevations. It is also designed to create additional flexibility to incentivize voluntary conservation of water to be stored in Lake Mead, thereby increasing lake levels (Congressional Research Service 2021).

As described in many of the plans above, often there is an expectation that future water supply could be met given certain parameters, such as proposed water supply projects are constructed and operational, entitlements are fully granted, and water use reduction measures are successful. These factors are highly uncertain, and in some cases such as rainfall and drought conditions, are uncontrollable by the water agencies, districts, or suppliers.

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan and impact projections from adopted plans within state of California, the Lower Colorado River Basin, and northern Baja California region were significant when considered together, even if not independently significant.

As described above, significant water supply impacts were not identified for proposed Plan growth and land use change and transportation network improvements in 2025. However, the SCAG 2020-2045 RTP/SCS was found to contribute to cumulatively considerable demand on water resources. While many of the regional water supply planning documents anticipate being able to adequately meet future water demand in the near term, their ability to do so is based on anticipated, but uncertain circumstances. Furthermore, a number of additional indeterminate factors could affect future water supply, including meteorological conditions; climate change; cost and use of energy; potential policy and permitting restrictions; endangered species protections; and demographic unknowns. The combined cumulative impacts of these regional and statewide plans, coupled with the uncertainties mentioned above, would be significant regarding increased demands on existing water supplies such that they could be inadequate to serve future demands, and new or expanded water supplies or entitlements would be needed by 2025.

Regional growth and land development would result in population increases on land overlying one of the three groundwater basins requiring preparation of a GSP because of being identified as medium priority by DWR. Regional growth and land development would also occur on land overlying groundwater basins identified by the County (2011) as having insufficient storage. Regional growth on land overlying medium-priority groundwater basins would also contribute to an existing aquifer overdraft. Groundwater impacts of regional growth and land use change would cumulatively significant in the Year 2025.

Cumulative demand for water supply as a result of regional growth and land use change would likely necessitate the need for new water treatment or distribution facilities or the expansion of existing facilities. Construction of new or expanded facilities would cause short-term construction impacts that are typically controllable through adherence to regulations and BMPs, as well as operational impacts. There is no assurance the impacts from new or expanded water facilities would be less than significant for all projects. The SCAG 2020-2045 RTP/SCS was also found to contribute to cumulatively considerable demand on associated water supply infrastructure. Thus, the cumulative impact related to construction of new or expanded water treatment or distribution facilities would be significant in 2025.

Because cumulative water supply impacts throughout the state of California, the Lower Colorado River Basin, and northern Baja region by 2025 would therefore be significant, and because the proposed Plan's incremental water supply impacts are significant, the proposed Plan's incremental water supply impacts are also cumulatively considerable (Impact C-WS-1).

2035

The cumulative analysis presented above for year 2025 would be applicable to year 2035. While significant water supply impacts were not identified for proposed Plan growth and land use change and transportation network improvements in 2035, the combined cumulative water supply impacts of regional and statewide plans, coupled with the uncertainties mentioned in the 2025 analysis, would be significant in 2035 regarding available water supplies.

A decrease in population between 2026 and 2035 is forecast in the areas overlying the groundwater basins designated as medium priority by DWR is forecasted. Nevertheless, growth would continue to occur on land overlying other groundwater basins and fractured rock aquifers identified by the County of San Diego (2011) as having insufficient storage. This continued growth is a significant cumulative impact to groundwater sustainability.

Construction of new or expanded facilities would cause short-term construction impacts that are typically controllable through adherence to regulations and BMPs, as well as operational impacts. There is no assurance the impacts from new or expanded water facilities would be less than significant for all projects. The SCAG 2020-2045 RTP/SCS was also found to contribute to cumulatively considerable demand on associated water supply infrastructure. Thus, the cumulative impact related to construction of new or expanded water treatment or distribution facilities would be significant in 2035.

Because cumulative water supply impacts throughout the state of California, the Lower Colorado River Basin, and northern Baja region by 2035 would be significant, and because the proposed Plan's incremental water supply impacts are significant, the proposed Plan's incremental water supply impacts are also cumulatively considerable in 2035 (Impact C-WS-1).

2050

The cumulative analysis presented above for years 2025 and 2035 would be applicable to year 2050. In addition, water planning documents prepared by water agencies in the region have no projections for water supplies after 2045. Significant water supply and facility impacts were identified for proposed Plan growth and land use changes as well as transportation network improvements in 2050. The combined cumulative water supply impacts of regional and statewide plans coupled with the uncertainties mentioned in the 2025 analysis, would be significant in 2050 regarding increased water demands on existing supplies such that they would be inadequate to serve future demands.

Regional growth and land use change between 2036 and 2050 would continue to occur on land overlying groundwater basins and fractured rock aquifers identified by the County (2011) as having an insufficient level of aquifer storage to ensure sustainability. Forecasted regional growth would increase the population of land overlying two of the groundwater basins designated as medium priority by DWR. Growth between 2036 and 2050 would exacerbate current unsustainable condition characterizing these aquifers and would cause a significant cumulative groundwater impact.

Construction of new or expanded facilities would cause short-term construction impacts that are typically controllable through adherence to regulations and BMPs, as well as operational impacts. There is no assurance the impacts from new or expanded water facilities would be less than significant for all projects. The SCAG 2020-2045 RTP/SCS was also found to contribute to cumulatively considerable demand on associated water supply infrastructure. Thus, the cumulative impact related to construction of new or expanded water treatment or distribution facilities would be significant in 2050.

Because cumulative water supply impacts throughout the state of California, the Lower Colorado River Basin, and northern Baja region by 2050 would therefore be significant, and because the proposed Plan's incremental water supply impacts are significant, the proposed Plan's incremental water supply impacts are also cumulatively considerable (Impact C-WS-1).

Mitigation Measures

C-WS-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS TO WATER SUPPLY

Mitigation measure **WS-1a** calls for implementation of water conservation measures for transportation projects. Mitigation measure **WS-1b** calls for the implementation of water conservation measures as part of land development projects. Mitigation measure **WS-1c** calls for verification of adequate water supply

availability to satisfy projected water demands. Implementation of mitigation measures **WS-1a**, **WS-1b**, and **WS-1c** would not guarantee reduction of all proposed Plan impacts associated with the availability of water supplies to a level of less than significant. Therefore, the proposed Plan's incremental contributions to the cumulative water supply impacts in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

To reduce environmental impacts resulting from land use changes and transportation facility development on the sustainable yield of groundwater basins, mitigation measure **WS-2** calls for the County of San Diego, cities, and other local jurisdictions to ensure sustainable yield of groundwater basins during planning, design, and project-level CEQA review of development projects. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, the proposed Plan's incremental contributions to the cumulative impacts to the sustainability of groundwater resources in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

To reduce environmental impacts resulting from the construction of new or expanded water treatment of distribution facilities, mitigation measure **WS-3** calls for jurisdictions or agencies with responsibility for the construction of new or expanded water treatment and conveyance facilities apply necessary mitigation measures to reduce significant environmental impacts associated with these facilities during the CEQA review process for individual facilities. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level. Therefore, the proposed Plan's incremental contributions to the cumulative impacts from new or expanded water facilities in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

5.2.19 WILDFIRE

C-WF-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO WILDFIRE

The area of geographic consideration for cumulative impacts is the Southern California and northern Baja region. Large-scale land use change and improvements to the transportation system influence the regional development pattern, thereby altering the level of risk exposure to buildings, transportation facilities, and people to the risks posed by wildfire. The most immediate indication of potential wildfire risk is the projected location of new development, either structures or transportation facilities, in areas classified as Very High Fire Severity Zones (VHFSZs). Post-fire slope instability poses a risk in the form of debris flows and landslides. Wildfires pose a significant public health risk due to their air quality impacts.

A projection approach is used for the cumulative analysis of wildfire risk as growth, land use change, and transportation network improvements across the region can result in the placement of structures and people in VHFSZs and in areas adjacent to slopes posing risks after wildfires. The cumulative impact is the combination of the impacts of the proposed Plan and similar impacts identified in adopted plans. Significant cumulative impacts related to wildfire would occur if the proposed Plan and other planning documents would induce substantial increases in structures and residents in areas with a high risk of wildfire or of post-fire debris flows or slope failures. In addition, placement of development in areas characterized by high fire risk increases the likelihood of wildfires and the resulting regional exposure to public health risk due to air quality impacts.

This cumulative impact assessment considers and relies on the impact analysis within this EIR for the proposed Plan, and EIR for the SCAG 2020-2045 RTP (SCAG 2020b), and the EIR for the most recent update of

the San Diego County General Plan (2011). Comparable information is not available for Baja California, however a United Nations-sponsored assessment of natural disaster risk in Baja California indicated a situation that, with respect to natural conditions, anticipated growth, and identified wildfire risk, is very similar to conditions in Southern California (Global Risk Identification Program 2011).

Impacts of the Proposed Plan

The proposed Plan would result in significant wildfire risk impacts. Impacts associated with wildfire hazards related to implementation of the proposed Plan are analyzed in Section 4.19. Development of transportation or land development projects in wildfire-prone areas would cause an increase in population exposed to wildfire risk as a result of development in VHFSZs, would expose people to post-fire risks associated with debris flows, flash floods and landslides, and exacerbate exposure of those populations to pollutant concentrations from wildfires, particularly populations living downwind of the fire. These impacts would be significant (Impacts WF-1 through WF-3).

Impact Projections in Adopted Plans

Potential development resulting from implementation of regional plans could occur in wildfire areas and could result in additional impacts related to wildfire. SCAG's 2020–2045 RTP/SCS (SCAG 2020a) covers all of the other counties in Southern California, i.e., Los Angeles, Orange, Imperial, Riverside, San Bernardino and Ventura. The EIR for the SCAG RTP/SCS (SCAG 2020b) identified significant impacts related to wildfire risk, concluding that development resulting from the plan would be responsible for "exposing occupants to wildfire risks and pollutant concentrations from wildfire, and exposing people or structures to post-fire slope instability. Wildfires pose a significant public health risk due to their air quality impacts."

The County General Plan Update EIR was prepared prior to the amendment to the CEQA Guidelines requiring the analysis of wildfire as a separate environmental issue. The EIR (County of San Diego 2011) did conclude in the Public Services section, however, that "…the development of future land uses as designated in the proposed General Plan Update would increase demand for fire protection services requiring the provision of new or physically altered fire facilities, which would have the potential to result in adverse environmental impacts. Therefore, the proposed project, in combination with the identified cumulative projects, would have the potential to result in a significant cumulative impact associated with fire protection services."

Cumulative Impacts and Impact Conclusions

2025

A significant cumulative impact in the year 2025 would result if the combined impacts of the proposed Plan and impact projections from the other adopted plan were significant when considered together, even if not independently significant. It was concluded that the proposed Plan would result in significant impacts related to wildfire risk. This impact determination was based on projected land development of approximately 6,655 acres of land classified as a VHFSZ. An additional 50 acres of land classified as VHFSZ would be developed with transportation facilities. The potential need to extend electrical transmission and other infrastructure into these fire-prone areas was identified as a significant impact, as were the post-fire risks in these posed by potential debris flows, landslides, and drainage changes on nearby slopes. In addition, the exposure of additional people and structures to risk of loss, injury, or death involving wildland fires, and including exposure of harmful pollutant concentrations in the form of wildfire smoke, was identified as a significant impact The EIR for the SCAG 2020-2045 RTP/SCS (2020b) identified similar impacts for six additional counties to the north

and east of San Diego County. The County of San Diego General Plan Update EIR (2011) concluded that a significant cumulative impact would result from the expanded fire services required by planned future growth. While comparable analysis for Baja California is not available, the combination of similar landscape and rapid demographic growth allows a similar conclusion.

Because cumulative wildfire impacts throughout Southern California, and likely in the northern Baja region by 2025 would be significant, and because the proposed Plan's incremental wildfire impacts are significant, the proposed Plan's incremental wildfire impacts are also cumulatively considerable in 2025 (Impact C-WF-1).

2035

A significant cumulative impact in the year 2035 would result if the combined impacts of the proposed Plan and impact projections from the other adopted plan were significant when considered together, even if not independently significant. It was concluded that the proposed Plan would result in significant impacts related to wildfire risk. This impact determination was based on projected land development of approximately 1,737 acres of land classified as a VHFSZ. An additional 524 acres of land classified as VHFSZ would be developed with transportation facilities. The potential need to extend electrical transmission infrastructure into these fire-prone areas was identified as a significant impact, as were the post-fire risks in these posed by potential debris flows, landslides, and drainage changes on nearby slopes. In addition, the exposure of additional people and structures to risk of loss, injury, or death involving wildland fires, and including exposure of harmful pollutant concentrations in the form of wildfire smoke, was identified as a significant impact. The EIR for the SCAG 2020-2045 RTP/SCS (2020b) identified similar impacts for six additional counties to the north and east of San Diego County. The County of San Diego General Plan Update EIR (2011) concluded that a significant cumulative impact would result from the expanded fire services required by planned future growth. While comparable analysis for Baja California is not available, the combination of similar landscape and rapid demographic growth allows a similar conclusion.

Because cumulative wildfire impacts throughout Southern California, and likely in the northern Baja region by 2035 would be significant, and because the proposed Plan's incremental wildfire impacts are significant, the proposed Plan's incremental wildfire impacts are also cumulatively considerable in 2035 (Impact C-WF-1).

2050

A significant cumulative impact in the year 2050 would result if the combined impacts of the proposed Plan and impact projections from the other adopted plan were significant when considered together, even if not independently significant. It was concluded that the proposed Plan would result in significant impacts related to wildfire risk. This impact determination was based on projected land development of approximately 172 acres of land classified as a VHFSZ. An additional 1041 acres of land classified as VHFSZ would be developed with transportation facilities. The potential need to extend electrical transmission infrastructure into these fire-prone areas was identified as a significant impact, as were the post-fire risks in these posed by potential debris flows, landslides, and drainage changes on nearby slopes. In addition, the exposure of additional people and structures to risk of loss, injury, or death involving wildland fires, and including exposure of harmful pollutant concentrations in the form of wildfire smoke, was identified as a significant impact. The EIR for the SCAG 2020-2045 RTP/SCS (2020b), whose wildfire effects extend through 2050, identified similar impacts for six additional counties to the north and east of San Diego County. The County of San Diego General Plan Update EIR (2011) concluded that a significant cumulative impact would result from the expanded fire services required by planned future growth. While comparable analysis for Baja California is not available, the combination of similar landscape and rapid demographic growth allows a similar conclusion.

Because cumulative wildfire impacts throughout Southern California, and likely in the northern Baja region by 2035 would be significant, and because the proposed Plan's incremental wildfire impacts are significant, the proposed Plan's incremental wildfire impacts are also cumulatively considerable in 2050 (Impact C-WF-1).

Mitigation Measures

C-WF-1 MAKE A CUMULATIVELY CONSIDERABLE CONTRIBUTION TO ADVERSE EFFECTS RELATED TO WILDFIRE.

Mitigation measure **WF-1** is intended to reduce wildfire risk for development and transportation projects during planning, design, and project-level CEQA review of projects in areas classified as VHFHSZs. SANDAG and other transportation project sponsors would implement measures to reduce impacts from wildfires. Mitigation measure **WF-2** would require that during planning, design, and project-level CEQA review of transportation network improvements or development projects located in SRAs or in LRAs classified as VHFHSZs, local jurisdictions, and public service and utility providers would ensure that project sponsors implement measures to reduce impacts from wildfire-associated infrastructure. Mitigation measure **WF-3** would reduce post-fire risks related to flooding, landslides, slope instability, or drainage changes resulting from development and transportation projects. It would apply to planning, design, and project-level CEQA review of development projects or transportation network improvement projects in areas classified as VHFHSZs. Local agencies would ensure that project applicants work with local communities to implement measures to reduce post-fire impacts.

Implementation of mitigation measures **WF-1, WF-2** and **WF-3** would not guarantee reduction of all proposed Plan impacts associated with wildfire to a level of less than significant. Therefore, the proposed Plan's incremental contributions to the cumulative water supply impacts in years 2025, 2035, and 2050 would remain cumulatively considerable post-mitigation.

6 ALTERNATIVES ANALYSIS

6.1 RATIONALE FOR ALTERNATIVES SELECTION

CEQA requires the consideration of alternatives to the proposed Plan and the analysis of impacts associated with those alternatives. By comparing the proposed Plan to the alternatives, the advantages of each can be weighed and analyzed. Section 15126.6 of the CEQA Guidelines requires that an EIR "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives."

Additionally, the CEQA Guidelines state the following:

- The specific alternative of "no project" shall also be evaluated along with its impact. If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. [Section 15126.6(e)(1)(2)]
- An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives that are infeasible. The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly discuss the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts. [Section 15126.6(a)(c)]
- "Feasible" means capable of being accomplished within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors. [Section 15364]

CEQA requires identification of alternatives that would avoid or substantially lessen the significant impacts of the proposed Plan. Based on the analysis in Chapter 4, *Environmental Impact Analysis*, construction and operational activities associated with forecasted regional growth and land use change and planned transportation network improvements and programs under the proposed Plan would result in significant impacts for many resource topics. Of these topics, air quality and greenhouse gas (GHG) impacts were of particular concern to the public during the EIR scoping and planning processes.

Among other things, the comments provided on the Notice of Preparation (NOP) and during development of the proposed Plan focused on a common theme of avoiding or substantially lessening GHG emission and air quality impacts through major reductions in vehicle miles traveled (VMT). Various transportation investments and policy options were recommended in the comment letters to achieve the major reductions in VMT. SANDAG developed the 5 Big Moves to address many of these concerns. The proposed Plan achieves GHG and VMT reductions by compacting development and increasing transit utilization, which also have the effect of reducing other impacts, such as loss of wildlife habitat or agricultural land.

The range of alternatives analyzed in detail in the EIR is in large part based on these public and stakeholder GHG and VMT comments. The remaining parts of this section provide the following:

- A description of alternatives considered in detail.
- A summary of the environmental impacts of each alternative and a comparison of each alternative's impacts to those of the proposed Plan. The focus of this analysis is to determine if alternatives are capable of avoiding or substantially lessening the significant environmental effects of the proposed Plan to a less-than-significant level.
- A discussion of the environmentally superior alternative.
- A discussion of alternatives considered but rejected from detailed analysis.

6.2 ALTERNATIVES CONSIDERED IN DETAIL

Aside from Alternative 1: No Project, the alternatives analyzed in detail are considered potentially feasible for the purposes of a CEQA analysis of alternatives to the proposed Plan, although some of elements of the alternatives may require major changes in legislation or policy or in the availability of funding. The alternatives are described below. The primary focus of the alternatives descriptions is on the characteristics that differentiate them from the proposed Plan.

Appendix O provides the following information to support the analysis of the alternatives:

- Table O-1 provides a list of the "No Build" projects that are assumed to be implemented for the No Project Alternative.
- Table O-2 provides performance measures data for the proposed Plan and Alternatives Considered in Detail in this EIR, including population, housing, and employment information.
- Table O-3 provides Senate Bill (SB) 375 GHG reduction for Alternatives Considered in Detail in this EIR.
- Table O-4 provides the EMFAC 2017 onroad output summary for Alternatives Considered in Detail in this EIR.

6.2.1 ALTERNATIVE 1: NO PROJECT

CEQA requires a No Project Alternative to be analyzed in the EIR. The No Project Alternative assumes that the proposed Plan would not be adopted or implemented.

The No Project Alternative assumes the Series 14 Regional Growth Forecast with the 2019 Federal Regional Transportation Plan (2019 Federal RTP) land use pattern, plus the Regional Housing Needs Assessment 6th Housing Element Cycle 2021-2029 (6th Cycle RHNA) housing allocations for adopted by the SANDAG Board of Directors (SANDAG Board) in July 2020. The Series 14 Regional Growth Forecast was generated to support the 2019 Federal RTP, which was adopted by the SANDAG Board on October 25, 2019. The 2019 Federal RTP land use pattern and 6th Cycle RHNA would likely be implemented even if the proposed Plan were not adopted because they are based on the adopted general plans of the 18 cities and County government except where additional planning assumptions were necessary to accommodate the 6th Cycle RHNA, which must be implemented under State law. Following the January 2020 release of the California Department of Finance (DOF) population projections, SANDAG developed an updated version of the Series 14 Regional Growth Forecast to reflect the new population projections as the latest planning assumptions. Table O-2 (Appendix O of this EIR) provides a comparison of the population, housing, and employment for the proposed Plan and the alternatives.

Although the total population, number of housing units, and number of jobs by 2050 would likely be the same as the proposed Plan under this alternative, the pattern of development within the region would be less compact because all transit improvements included in the proposed Plan would not be available to support the focused transit-oriented development pattern envisioned in the proposed Plan. SANDAG transportation and growth modeling has shown that the likelihood of housing stock and households developing and moving to an area is directly correlated to the accessibility of transportation and employment. In the absence of the future transportation network improvements and programs identified in the proposed Plan, it is likely that the future land use pattern would see less concentration of population, housing, and jobs in major transportation corridors and more growth occurring in less developed areas of the region than would occur under the proposed Plan.

The No Project Alternative includes "No Build" transportation projects likely to be implemented if the proposed Plan were not adopted. These consist of transportation projects with environmental clearance, that have full funding, are under construction, or are otherwise reasonably foreseeable based on current plans, as listed in Table O-1 (Appendix O of this EIR). Future project development and implementation under the No Project Alternative would be limited as SANDAG would fall out of compliance with the State and federal funding requirement of an adopted RTP and SCS on January 1, 2022 (State) and October 25, 2023 (federal).

6.2.2 ALTERNATIVE 2: 2019 TRANSPORTATION NETWORK WITH NEW VALUE PRICING AND USER FEE POLICIES

Alternative 2 consists of the 2019 Federal RTP transportation network and land use pattern, combined with the new value pricing and user fees policies in the proposed Plan that are compatible with the 2019 Federal RTP network. This alternative could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects by minimizing changes to the existing land use plans in the region.

Alternative 2 consists of the land uses in the 2019 Federal RTP, and reflects the adopted general plans of the 18 cities and County except where additional planning assumptions were necessary to accommodate the 6th Cycle RHNA adopted in July 2020, plus the DOF January 2020 release of the State's population projections. Table O-2 (Appendix O of this EIR) provides a comparison of the population, housing, and employment for the proposed Plan and the alternatives. Land uses for Alternative 2 would be the same as for the No Project Alternative because this land use pattern is based on the adopted 2019 Federal RTP, the adopted general plans of the 18 cities and County, and the State-mandated 6th Cycle RHNA, which would be implemented even if the proposed Plan were not adopted.

Alternative 2 includes the 2019 Federal RTP transportation network (included in Appendix O of this EIR) with the addition of policies and programs of the Proposed Plan, including toll pricing, microtransponder ownership, telework assumptions, and micromobility. Table 6-1 provides a comparison of the components of each of the alternatives considered in detail.

This alternative does not include the development of the Mobility Hubs or Complete Corridors as envisioned in the proposed Plan. This alternative also does not include additional high frequency transit beyond what is shown in the 2019 Federal RTP because the supporting land uses are not included in the 2019 Federal RTP land use pattern. Funding for Alternative 2 would be consistent with the funding proposed in the 2019 Federal RTP.

Table 6-1
Summary of Alternatives Considered in Detail

Components		Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
Land Use Pattern		2019 Federal RTP Land Use Pattern	2019 Federal RTP land use pattern	Similar to Proposed Plan except land use pattern with new growth focused in proposed mobility hubs
Transportation Network		"No Build" Projects	2019 Federal RTP transportation network	Proposed Plan transportation network
New Value Pricing and User Fees Policies	*Toll Pricing*	Existing Policy	Same as proposed Plan (By 2035, update toll pricing to $0.30 per mile on I-15 and other Managed Lane facilities)	Same as proposed Plan (By 2035, update toll pricing to $0.30 per mile on I-15 and other Managed Lane facilities)
	Road User Charge	None	None	By 2026, increase road user charge rate to ~~3~~ 4.95 cents/mile, compared to ~~2~~3.3 cents/mile by 2030 in the proposed Plan~~.~~
	Parking Costs	Existing Policy	2019 Federal RTP	Increases in parking costs by 50% compared to the proposed Plan.
	Transit Costs	Existing Policy	2019 Federal RTP (No planned transit fare discounts.)	Free transit by 2035.
	Microtransit Costs	N/A	N/A	Free Microtransit by 2035, compared to $1.25 one way/$3 day in the proposed Plan
	Micro-Transponder ownership	N/A	Same as proposed Plan (Microtransponder[2] ownership of 100 percent by 2035)	Same as proposed Plan (Microtransponder ownership of 100 percent by 2035)
	Telework Assumptions	N/A	Same as proposed Plan	Same as proposed Plan
	Micromobility	N/A	Same as proposed Plan (Increases in micro-mobility through assumed personal owned e-bike growth)	Same as proposed Plan (Increases in micro-mobility through assumed personal owned e-bike growth)

Components	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
Funding	Committed funding	2019 Federal RTP ($130 billion)	Same as Proposed Plan ($163 billion)

[1] These consist of transportation projects with environmental clearance, that have full funding, are under construction, or are otherwise reasonably foreseeable based on current plans.

[2] A microtransponder is an electronic toll collection device that allows users to pay tolls automatically from inside their vehicle.

6.2.3 ALTERNATIVE 3: ALL GROWTH FOCUSED IN MOBILITY HUBS AND MORE PROGRESSIVE VALUE PRICING AND USER FEE POLICIES

Alternative 3 consists of the proposed Plan transportation network, a land use pattern that restricts all regional growth to the mobility hubs, and more progressive value pricing and user fees policies than what is included in the proposed Plan. This alternative could feasibly accomplish most of the basic objectives of the project and could substantially lessen one or more of the significant effects: specifically, VMT and GHG emissions reductions due to more compact development and increased mode shift. Land use in Alternative 3 is similar to the proposed Plan, but would focus all growth in proposed mobility hubs throughout the County to further reduce VMT and GHG emissions. The regional mobility hub areas are the same as the proposed Plan, and are depicted on Figure 2-35 of Chapter 2, *Project Description,* of this EIR.

Alternative 3 would include the following more progressive value pricing and user fee policies than those offered in the proposed Plan, as shown in Table 6-1.

Alternative 3 includes the same transportation network as the proposed Plan, and funding for Alternative 3 would be the same as described for the proposed Plan. Table 6-1 provides a comparison of the components of each of the alternatives considered in detail.

6.2.4 PROJECT OBJECTIVES

Alternatives were generated as alternate means of achieving most of the basic objectives of the proposed Plan. As stated in Chapter 2, these basic objectives are to:

1. Focus population and employment growth in mobility hubs and existing urban areas to protect sensitive habitat and natural resource areas.
2. Provide transportation investments that support compact land development patterns and reduce sprawl.
3. Meet greenhouse gas emissions targets established for the San Diego region by the California Air Resources Board and the SANDAG Board of Directors.
4. Provide transportation investments and land use patterns that promote social equity.
5. Provide transportation investments and land use patterns that reduce vehicle miles traveled and improve air quality.
6. Provide multi-modal access to employment centers and key destinations for all communities.
7. Enhance the efficiency of the transportation network for moving people and goods through the deployment of new technologies.

Table 6-2 shows that all of the action alternatives considered in detail in this EIR partially or fully meet most of the basic Plan objectives with the exception of Alternative 1: No Project. In this table, a “yes” indicates an alternative has the ability to at least partially, if not fully, meet project objectives.

Table 6-2
Ability of Alternatives Considered in Detail in this EIR to Meet Basic Project Objectives

Project Objectives	Proposed Plan	Alternatives Considered in Detail in this EIR		
		Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
1. Focus population and employment growth in mobility hubs and existing urban areas to protect sensitive habitat and natural resource areas.	Yes	No, alternative does not include mobility hubs.	No, alternative does not include mobility hubs.	Yes, alternative includes all new growth around mobility hubs
2. Provide transportation investments that support compact land development patterns and reduce sprawl.	Yes	No, alternative does not include transportation investments that would reduce sprawl	Yes, alternative includes incentivizing investments in smart growth areas	Yes, alternative includes investments to reduce sprawl similar to the proposed Plan
3. Meet greenhouse gas emissions targets established for the San Diego region by the California Air Resources Board and the SANDAG Board of Directors.	Yes	No, see Appendix O, Table O-3 for SB 375 target achievement	No, see Appendix O, Table O-3 for SB 375 target achievement	Yes, see Appendix O, Table O-3 for SB 375 target achievement
4. Provide transportation investments and land use patterns that promote social equity.	Yes	No, alternative does not include transportation investments and land use patterns that would promote social equity	Yes, alternative includes transportation investments and land use patterns that would promote social equity	Yes, the transportation network for this alternative is the same as the proposed Plan; the land use pattern for this alternative focuses growth in mobility hubs to maximize transit access to employment, educational, and recreational

Project Objectives	Proposed Plan	Alternatives Considered in Detail in this EIR		
		Alternative 1: No Project	**Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies**	**Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies**
				opportunities throughout the region
5. Provide transportation investments and land use patterns that reduce vehicle miles traveled and improve air quality.	Yes	No, alternative does not include transportation investments and land use patterns that would reduce vehicle miles traveled and improve air quality	Yes, based on the modeling results identified in Tables O-2 and O-3 (Appendix O of this EIR), this alternative would reduce vehicle miles traveled and improve air quality	Yes, based on the modeling results identified in Tables O-2 and O-3 (Appendix O of this EIR); this alternative would reduce vehicle miles traveled and improve air quality
6. Provide multi-modal access to employment centers and key destinations for all communities.	Yes	No, alternative does not include transportation investments and land use patterns that would further provide multi-modal access to employment centers	Yes, the transportation improvements and land use pattern as part of this alternative would encourage growth within smart growth areas	Yes, the transportation network for this alternative is the same as the proposed Plan, and this alternative would increase growth around mobility hubs
7. Enhance the efficiency of the transportation network for moving people and goods through the deployment of new technologies.	Yes	No, alternative does not include transportation investments and land use patterns that would move people and goods with new technologies	Yes, this alternative does include transportation systems and demand management projects and emerging technologies that would move people and goods	Yes, the transportation network for this alternative is the same as the proposed Plan

6.3 ALTERNATIVES COMPARISON

Table 6-3 (at the end of this chapter) provides a list of impacts and their significance for Alternatives 1, 2, and 3, with a comparison of the impacts of each alternative to those of the proposed Plan. Calculations for the alternatives analysis are provided in Appendix O of this EIR.

6.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Based on the analysis of alternatives provided in Table 6-3, Alternative 3 is the environmentally superior alternative. Although Alternative 3 would not reduce any of the proposed Plan's significant impacts to less-than-significant levels, it would reduce many of the proposed Plan's significant impacts. Compared to the proposed Plan's significant impacts, Alternative 3 would have decreased impacts for one or more significance criteria for the following environmental resources: aesthetics and visual resources. agricultural and forestry resources. air quality. biological resources. cultural resources. energy. paleontological resources. greenhouse gas emissions. mineral resources. noise and vibration. public services. transportation. tribal cultural resources. water supply. and wildfire. Compared to the proposed Plan's significant impacts, Alternative 3 would have increased impacts for only a few significance criteria: for land use, and population and housing.

Alternative 3 would result in a ~~23 -~~23.1 percent per capita GHG reduction in 2050, which would result in a greater reduction than the proposed Plan (~~20.7~~-21.0 percent below 2005 in 2050). In addition, Alternative 3 would result in VMT per capita of ~~16.3~~15.6 (~~for all vehicle classes~~home-based) compared to the proposed Plan VMT per capita of ~~16.8~~16.03 in 2050 (see Appendix O, Table O-2). Alternative 3 would result in a total VMT increase of ~~3,479,273~~2,756,715 miles per day in year 2050, which is approximately ~~38~~ 39 percent lower than the proposed Plan (total VMT increase of ~~5,611,752~~4,519,230 miles per day in year 2050). Alternative 3 would also result in a decrease in reactive organic gases (ROG), nitrous oxides (NO_X) (with the exception of a 0.01-ton-per-day increase in 2025), carbon monoxide (CO), fine and respirable particulate matter (PM2.5 and PM10), and sulfur oxide (SO_X) emissions compared to the proposed Plan from onroad sources.

Among the alternatives, Alternative 3 would achieve the greatest reductions of VMT, GHG emissions, and air quality emissions as compared to the proposed Plan.

6.5 ALTERNATIVES CONSIDERED BUT REJECTED

This section discusses several alternatives that were considered by SANDAG decision makers or raised by the public during the planning process for the proposed Plan, or that were raised in public comments on the NOP for the EIR, but were rejected from detailed consideration in this EIR. Reasons for rejecting these alternatives include the following:

- Major elements of the alternative are already included in the proposed Plan or one of the alternatives evaluated in detail in this EIR.
- The alternative is infeasible due to economic, legal, or other considerations.
- The alternative fails to reduce any of the proposed Plan's significant environmental impacts.
- The alternative fails to meet most of the basic project objectives.
- The alternative is for individual project components rather than the proposed Plan as a whole.

6.5.1 ACCELERATED PLAN IMPLEMENTATION

As discussed in Section 4.16, *Transportation,* implementation of the proposed Plan would result in significant VMT and GHG impacts. The proposed Plan includes land use growth and transportation improvements that, when implemented, would reduce VMT. However, to further reduce VMT and GHG impacts for years 2025 and 2035, greater transit ridership would need to be achieved earlier than projected. To accomplish this the implementation of the proposed Plan would need to be accelerated.

Reasons for Rejection:

Implementation of the proposed Plan is constructed as a system of integrated land use growth and transportation improvements. Several of the transportation improvements are directly related to increases in land use growth. VMT and GHG reductions under the proposed Plan result from the increasing land uses and resident populations incompact transit-oriented development within mobility hubs. Both the land use changes, and the transportation improvements are essential for the system to work. Under SB 375, an SCS cannot supersede the land use authority of the cities and counties within the region. Therefore, SANDAG does not have the authority to accelerate land use concentration in the region and so several of the transportation improvements, e.g., Mobility Hubs, cannot be accelerated until the corresponding land use growth occurs.

In addition, funding is not available to accelerate the construction of the proposed Plan. The funding strategy for the proposed Plan considers all reasonably anticipated revenues to be received out to 2050. These funds will come with constraints. A majority of the anticipated funds will be tied to certain types of projects (for example, transit infrastructure or highway operations and maintenance), and SANDAG does not have the authority to interchange them. These constraints include requirements from Congress or the State Legislature, and the investment strategy for the proposed Plan is aligned with those rules. SANDAG is also constrained by when funds will become available over the 30-year life of the proposed Plan. More than half of anticipated revenues are not expected to become available until the 2036–2050 timeframe.

For these reasons, this alternative has been rejected from further consideration.

6.5.2 2019 FEDERAL RTP PLUS UPDATED DEPARTMENT OF FINANCE POPULATION AND TELEWORK

This alternative consists of the land uses in the 2019 Federal RTP, and reflects the adopted general plans of the 18 cities and County, except where additional planning assumptions were necessary to accommodate the 6th Cycle RHNA adopted in July 2020, and the DOF January 2020 release of the State's population projections. Table O-2 (Appendix O of this EIR) provides a comparison of the population, housing, and employment for the proposed Plan and the alternatives. Land uses for Alternative 2 would be the same as for the No Project Alternative, because this land use pattern is based on the adopted 2019 Federal RTP and the adopted general plans of the 18 cities and County and the State-mandated 6th Cycle RHNA, which would be implemented even if the proposed Plan were not adopted.

In addition, this alternative would only include the following telework policies, but not all of the other policies and programs included for Alternative 2, as discussed above:

- Increases in primary and occasional telework jobs by 2025, 2035, and 2050 based on latest planning assumptions. In 2025, projected 9.7 percent of employment would be primarily telework, and another 9.8 percent would be occasional telework. In 2035, it is projected that 10.9 percent of jobs would be primary telework, and another 11.8 percent would include occasional telework. In 2050, it is projected that 12.7

percent of employment would be primary telework jobs, and another 14.8 percent would include occasional telework.

This alternative is essentially proposed Alternative 2 without new value pricing and user fees. Adding new value pricing and user fees results in lower VMT and reduced GHG, and as such this alternative would result in more VMT and more GHG than Alternative 2. As discussed in Table 6-3, Alternative 2 would result in a ~~13.2~~12.6 percent per capita GHG reduction by 2035, which would not meet the SB 375 2035 GHG reduction target established by CARB for the proposed Plan. There is no evidence that this alternative would avoid or substantially reduce any of the proposed Plan's significant impacts. For these reasons, this alternative has been rejected from further consideration.

6.5.3 TRANSNET-CONSTRAINED TRANSIT ALTERNATIVE

In a January 13, 2015, NOP comment letter, Circulate San Diego, requested that the Regional Plan contain at least one transit-friendly reasonable alternatives that will mitigate environmental impacts. The requested that the alternative should be referred to as a "TransNet-Constrained Transit Alternative" and include the following elements:

- Advance as much public transit and active transportation as possible.
- Including investments from the unconstrained transit network (e.g., investments for which available funding was not identified in the proposed Plan).
- Delaying and eliminating general purpose highway and Managed Lane investments.
- Converting existing general purpose lanes to managed lanes.
- Providing more compact land use patterns.
- Substantially lowering transit fares.
- Substantially increasing the price of parking.
- Substantially increasing the cost of driving.

Reasons for Rejection:

This comment was received prior to SANDAG developing the 5 Big Moves Vision that served to guide the development of the proposed Plan. The proposed Plan substantially addresses many of the suggestions included in this proposed alternative (e.g., converting existing general purpose lanes to managed lanes, providing more compact land use patterns, substantially lowering transit fares, increasing the price of parking). In addition, Alternative 3 further expands on many of these components, including even more accelerated transit investments, more compact land use patterns, and high transit subsidies, parking pricing, and driving costs. The proposed Plan does not include investments drawn from the unconstrained transit network because the proposed Plan re-envisioned the entire transportation network, and because reasonably foreseeable funding sources for unconstrained projects have not been identified. The proposed Plan does not add funding to add general purpose freeway lanes, but instead focuses on adding Managed Lanes where feasible and appropriate by converting existing general purpose lanes or roadway shoulders. The proposed Plan cannot exclude all roadway and freeway funding and expansion as that would preclude the addition of Managed Lanes, which increase the efficiency of roadway travel for vehicles and transit. Further, there is no evidence that excluding funding for Managed Lanes would avoid or further and substantially reduce any of the proposed Plan's significant impacts identified in the EIR.

Because most of the major elements of the alternative are already included in the proposed Plan and/or Alternative 3, and are analyzed in this EIR, and because there is no evidence that this alternative would avoid or further and substantially reduce any of the proposed Plan's significant impacts, this alterative is rejected from further consideration.

6.5.4 COASTAL PROTECTION ALTERNATIVE

In a December 19, 2016, NOP comment letter received from the California Coastal Commission, an alternative was identified to consider the effects of sea level rise and minimize the need for shoreline armoring with the relocation of the rail corridor along the Del Mar bluffs. The letter also requests that the expected life of the rail corridor along the Del Mar bluffs and other existing infrastructure be analyzed given sea level rise and other environmental impacts.

Reasons for Rejection:

The request to analyze alternatives for the Del Mar Bluffs rail corridor is an individual project included in the proposed Plan rather than an alternative for the proposed Plan as a whole that can be considered. but need not discuss alternatives to each particular component of a project (See *California Oak Foundation v. Regents of University of California* (2010) 188 Cal. App. 4th 227, 276–277). Because it is limited, this alternative would not avoid or substantially reduce any of the proposed Plan's significant impacts. The Project (or proposed Plan) includes a proposal to move the rail corridor off the bluffs into a proposed tunnel by 2035 (TL06 Commuter Rail 398 in Appendix B of this EIR). Sea-level rise is a potential effect of Climate Change, which is discussed in impact analysis sections of this EIR and Appendix C of the EIR. For these reasons, this alternative has been rejected from further consideration.

6.5.5 CLIMATE, HOUSING, TRANSIT ALTERNATIVE

On May 26, 2021 SANDAG received a comment letter on the proposed Plan from Save Our Forest and Ranchlands (SOFAR) and the Cleveland National Forest Foundation (CNFF) requesting that the SANDAG Board of Directors "*include a Climate, Housing, Transit Alternative in the 2021 RTP update - an alternative focused on meeting both the housing needs and greenhouse gas ("GHG") reduction goals for a qualified land use area that have been set collectively by the State of California, the City of San Diego, and SANDAG"* that meets the following goals:

- 40 percent reduction in GHG below 1990 levels by 2030
- 80 percent reduction in GHG below 1990 levels by 2050
- 25 percent reduction in per capita GHG from passenger cars and trucks relative to 2005 by 2035
- 14.3 percent reduction in total daily VMT per capita, and 16.8 percent reduction in total light-duty VMT per capita, relative to 2015-2018 average by 2050
- 50 percent transit, walk and bike mode share for commuters within ½ mile of a major transit stop in City of San Diego by 2035
- 150 percent increase in transit mode share
- Adequately plan to meet the housing needs of everyone in the community
- SB 743 VMT reduction goals.

The SOFAR and CNFF comment letter requested than SANDAG consider the following specific components for the proposed Plan:

- Comprehensive transit investments in each of these four levels
    - Highest speed commuter/intercity rail in the LOSSAN corridor, including a double-track rail tunnel through Miramar Hill and rail line straightening
    - Higher-speed high-frequency transit, including separate rights of way, fewer stops grade separations, and new high-speed lines
    - An intermodal terminal (Grand Central) connecting Airport, central core, LOSSAN corridor, SPRINTER corridor, and trolley system
    - Local transit (bus or streetcar) and shared mobility
- Walkable compact land use
- Excluding roadway/freeway funding and expansion

In addition, on October 7, 2021, SANDAG received a letter from SOFAR in response to the Draft EIR. The letter requests that SANDAG analyze the effect that Managed Lanes have on transit ridership (i.e., how many transit trips would occur with Managed Lanes versus without Managed Lanes). The letter also suggests that the modeling for the proposed Plan should advance implementation of all transit projects in the first 10 years of the Plan in order to truly understand the effect that a comprehensive transit network would have in achieving the region's environmental and housing goals. In particular the letter suggests that the proposed Plan accelerate the implementation of the LOSSAN double track rail project and the Miramar tunnel rail line and straightening project.

Reasons for Rejection:

The proposed Plan includes comprehensive transit investments in each of the four levels identified in the Climate, Housing, Transit Alternative: high-speed commuter rail; tunneling and double-tracking where feasible; rail line straightening, higher-speed and higher-frequency transit with separate rights-of-way, fewer stops, grade separation, and new high-speed lines; a Central Mobility Hub that connects to the airport as well as to transit elements offering further interconnectivity throughout the San Diego region; and expanded local transit and shared mobility.

The proposed Plan also includes an intensified, compact land use, as well as expanded active transportation infrastructure improvements. The proposed Plan does not add funding to add general purpose freeway lanes, but instead focuses on adding Managed Lanes where feasible and appropriate by converting existing general-purpose lanes or roadway shoulders. The proposed Plan cannot exclude all roadway and freeway funding and expansion as that would preclude the addition of Managed Lanes, which increase the efficiency of roadway travel for vehicles and transit. Further, there is no evidence that excluding funding for Managed Lanes would avoid or further and substantially reduce any of the proposed Plan's significant impacts identified in the EIR. The proposed Plan meets some, but not all, of the Climate, Housing, Transit Alternative goals. The proposed Plan would exceed the GHG emission reduction targets for 2020 and 2035 established by CARB, as shown in Table 2-8. While CARB does not set targets beyond 2035, SANDAG has provided data in Section 4.8, *Greenhouse Gas Emissions*, of this EIR utilizing the same methodology to show continued GHG reductions beyond 2035. See Appendix O, Table 0-3. Similarly, as discussed in Section 4.16 of this EIR, the proposed Plan achieves a ~~14.1~~15.4 percent reduction (approximately ~~16.3~~17.6 percent with off model strategies included) in total daily VMT per capita by 2050 as compared to the proposed Plan baseline of 2016. Alternative 3 achieves still greater reductions. See Appendix O, Table 0-3.

Both the proposed Plan and Alternative 3 achieve a greater than 150 percent increase in walk to transit and drive to transit mode share by 2050, along with similar increases in walk and bike mode share. Mode share within ½ mile of a major transit stop is not specifically measured for the proposed Plan or Alternative 3.

As for meeting housing needs, the proposed Plan's SCS land use pattern identifies areas within the region sufficient to house the 6th Cycle RHNA Plan allocations. The adopted 6th cycle RHNA Plan for the San Diego region covers the 8-year period from 2021 through 2029. The RHNA allocates housing need in four income categories for each of the cities and San Diego County to use in their housing elements.

The remaining goals of the Climate, Housing, Transit Alternative are considered infeasible to achieve. As described above and in the analyses of this EIR, the proposed Plan includes several major changes in transportation investments and other policy changes specifically for the purpose of reducing total GHG and VMT. Even if SANDAG could achieve zero GHG emissions from the transportation sector (the area that SANDAG has the most control over), it still would not be possible to meet the targets of carbon neutrality by 2045 and 80 percent reduction of 1990 levels by 2050 due to emissions from non-transportation sectors. Table 4.8-8 in Section 4.8 shows total GHG emissions in the San Diego region from 2016 to 2050. Even assuming zero GHG emissions from the on-road transportation sector, the region would still have GHG emissions of ~~10.34~~10.31 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) by 2050, a ~~5.14~~5.11 $MMTCO_2e$ shortfall as compared to the State ~~target~~reference point of 5.2 $MMTCO_2e$ used for 2050 GHG emissions level analysis in the Draft EIR.

Similarly, Alternative 3, which has the most compact land use pattern and includes the most progressive measures to reduce VMT and GHG, is unable to meet the VMT goals of the Climate, Housing, Transit Alternative. Under Alternative 3, GHG and VMT would be reduced by 23.1 percent per capita and ~~16.8~~15.6 ~~percent~~ per capita, respectively, by 2050.

As discussed in Appendix P, *Response to Comments*, of the EIR, SANDAG conducted a modeling analysis to compare the proposed Plan network with Managed Lanes investments to a network consistent with SOFAR's request in the Draft EIR comment letter. The model run assumed no new Managed Lanes only transit lanes and accelerated the LOSSAN double-track rail project and the Miramar Tunnel rail line and straightening project to 2035. Converting Managed Lanes to transit lanes and accelerating the two rail projects as suggested for the SOFAR alternative results in similar VMT and GHG impacts as the proposed Plan, and does not substantially reduce them (see responses to comments 35-7 and 35-16).

With regards to accelerating transit to the first 10 years of the Plan, there are regulatory constraints on when money becomes available during the lifespan of the proposed Plan, meaning funding programs typically are approved or collected on an annual basis and much funding cannot be advanced. There are also constraints on which dollars stay with SANDAG and which dollars are distributed directly to other agencies to maintain, operate, and rehabilitate the transportation network. For instance, federal formula funds such as Federal Transit administration (FTA) Section 5307 or Regional Surface Transportation Program (RSTP) are apportioned annually; SANDAG can make assumptions about how much can be anticipated in the future based on historical data but has no ability to advance any project(s) that need the funding in years prior to apportionment. Other funds that SANDAG cannot advance and re-direct to transit include funds going to other agencies, such as the State Highway and Protection Program (SHOPP) funds, which are managed by the California Transportation Commission and are used for safety, operations, and rehabilitation projects on the state highway system by Caltrans.

~~Because the specific feasible components and feasible goals advanced in the Climate, Housing, Transit Alternative proposed by SOFAR and CNFF are already included in the proposed Plan and/or Alternative 3 and analyzed in this EIR;, and because the remaining components and goals are infeasible, as discussed above, this alternative has been rejected from further consideration.~~

In summary, the Climate, Housing, Transit Alternative was not selected for detailed consideration in the EIR because:

- Some- specific feasible components of this alternative are already included in the proposed Plan and/or Alternative 3.
- It is infeasible to accelerate transit to the first 10 years of the Plan and redirect all roadway funding to transit.
- The Climate, Housing, Transit Alternative results in similar VMT and GHG impacts as the proposed Plan, and does not substantially reduce them.
- It is infeasible to achieve the GHG and VMT reduction goals proposed in the Climate, Housing, Transit Alternative.

6.5.6 10 BIG MOVES TO TRANSPORTATION JUSTICE

On May 27, 2021 comment letter on the proposed Plan from the San Diego Transportation Equity Working Group (SDTEWG), a community-based coalition of the Center on Policy Initiatives, City Heights Community Development Corporation, Environmental Health Coalition, Mid-City CAN, and SanDiego350, requested that SANDAG include an alternative incorporating "*the 10 Big Moves to Transportation Justice."*

Two of the goals identified in the10 Big Moves to Transportation Justice Alternative, (1) an environmental-justice centered RTP and (6) youth opportunity passes, do not involve physical changes with physical environmental impacts.[1] Under CEQA, an EIR must analyze the impact of a project's physical changes on the physical environment. CEQA does not require EIRs to include an environmental justice analysis or address socioeconomic impacts unrelated to physical environmental impacts. While these two stated goals are not addressed below, they will be addressed by SANDAG staff and considered by the Board of Directors as the proposed Plan is finalized.

The remaining eight goals, which include physical changes with potential physical environmental impacts, are:

- (2) **Improve the Bus System Now:** Develop a bus system that is fast, frequent, reliable, and accessible by increasing frequency on popular lines, especially overcrowded ones. This should be done immediately as a way to introduce the public to a new transit era with short-term and long-term solutions. It should be done by providing MTS with the necessary financial support for implementation. EJ communities cannot afford to wait 10-20 years for solutions.
- (3) **Blue Line Express:** Fund the planning, environmental, engineering, and capital for the additional Blue Line track that allows express, 24-hour service, and additional frequency enhancements. Rail-grade separations should only move forward with the addition of a third track that eliminates conflict between the Blue Line and freight.

- (4) **24-Hour Service by 2025:** Provide 24-hour service on popular transit routes to connect late night and early morning workers to their jobs by 2025.
- (5) **Purple Line Serves Central City Heights:** Fund the planning, environmental, engineering, and capital for the Purple Line as a rail line that connects EJ communities in central City Heights and South Bay to Sorrento Valley.
- (7) **Electrify Bus Fleet by 2030:** Fund the implementation of California's Innovative Clean Transit rule to accelerate the electrification of the bus fleet ten years before mandated by the California Air Resources Board.
- (8) **Identify Anti-Displacement strategies:** Fund anti-displacement efforts to protect vulnerable communities living near transit corridors by developing an anti-displacement strategy that includes affordable/low-income housing and preservation of naturally occurring existing affordable housing, community ownership, and tenant protections.
- (9) **Bathroom network:** Develop a bathroom access plan and provide MTS with funding for a clean and accessible bathroom network open at all major transit stations.
- (10) **Emergency Ready Transit System:** Fund the planning and implementation of a transit emergency response strategy to provide safety particularly to EJ communities during community-wide emergencies.

Reasons for Rejection:

The proposed Plan and Alternative 3 (*All Growth Focused In Mobility Hubs and More Progressive Value Pricing and User Fee Policies*) of the EIR are consistent with goals (2), Improve the Bus System Now, and (7), Electrify Bus Fleet by 2030. The proposed Plan includes significant investments in Rapid buses as well as more efficient associated roadway infrastructure for operating those buses by 2050. The proposed Plan also supports the electrification of the region's transit buses and the State's Innovative Clean Transit regulation. Appendices A and B to the proposed Plan include SANDAG's proposed commitment through 2050 of $657 million for zero-emission buses and infrastructure, which is to support the implementation of MTS' and NCTD's Zero Emission Bus (ZEB) Rollout Plans. $325 million of SANDAG's investment is proposed between 2021-2035. Immediate implementation of all bus system improvements identified in the proposed Plan and accelerated bus fleet electrification by 2035 are economically infeasible due to funding constraints.

Goal (3), Blue Line Express, is not included in the proposed Plan, however, SANDAG will pursue a pilot study of the feasibility of adding a third express track on the Blue Line. There is no evidence that this goal would avoid or further and substantially reduce any of the proposed Plan's significant impacts identified in the EIR.

~~SANDAG will consider goal~~Goal (4), 24 Hour Service by 2025, ~~while finalizing the proposed Plan~~is not included in the proposed Plan; however, frequency for most transit service will be increased to 4 a.m. through 12 a.m. under the proposed Plan, with frequency of 4 a.m. through 2 a.m. for commuter rail routes 581, 582, and 583; light rail transit routes 399, 510, 520, and 555; and some bus routes. Twenty-four hour service is anticipated for the airport connection served by route 577. ~~t~~There is no evidence that this goal would avoid or further and substantially reduce any of the proposed Plan's significant impacts identified in the EIR.

The proposed Plan aligns with goal (5), Purple Line Serves Central City Heights. By 2035, the proposed Plan Purple Line connects Sorrento Mesa and National City via UTC, Kearny Mesa, and University Heights. By 2050, the proposed Plan Purple Line is extended from National City to CBX via San Ysidro. Additionally, the South Bay to Sorrento Comprehensive Multimodal Corridor Plan is currently studying a station in City Heights along

Commuter Rail 582. There is no evidence that this goal would avoid or further and substantially reduce any of the proposed Plan's significant impacts identified in the EIR.

Goal (8), Identify Anti-Displacement Strategies, is not addressed in the proposed Plan or Alternatives of the EIR; however, SANDAG is currently developing a Regional Housing Incentive Program through which SANDAG will look for opportunities to coordinate with interested stakeholders on issues like gentrification and displacement. There is no evidence that this goal would avoid or further and substantially reduce any of the proposed Plan's significant impacts identified in the EIR.

For goal (9), SANDAG will ~~consider goal (9), Bathroom Network, while finalizing the proposed Plan~~complete a Transit Station Bathroom Access Plan as part of implementing the proposed Plan; however, there is no evidence that this goal would avoid or further and substantially reduce any of the proposed Plan's significant impacts. Goal (10), Emergency Ready Transit System, is addressed in Appendix Q of the proposed Plan, which describes emergency evacuation strategies, including signaling, traffic control guides, roadblocks and barricades, electronic signage, land expansion, contra-flow lanes, traveler information services, use of mass transit, and airport uses. There is no evidence that this goal would avoid or further and substantially reduce any of the proposed Plan's significant impacts identified in the EIR.

For the reasons above, this alternative has been rejected from further consideration.

Table 6-3
Comparison of Alternatives 1, 2, and 3 to the Proposed Plan

This table provides a list of impacts and their significance for Alternatives 1, 2, and 3, with a comparison of the impacts of each alternative to those of the proposed Plan. Calculations for the alternatives analysis are provided in Appendix O of this EIR. The designation "significant impact" in Table 6-3 refers to the level of significance of the impact identified for the proposed Plan as analyzed in this EIR. Within the parentheses is the comparison of the alternative impact to the significance of the impact identified for the proposed Plan (i.e., same, increased, decreased). The level of significance may be the same for the proposed Plan and an alternative for a given threshold, but the impacts from an alternative may be increased or decreased to a degree without changing the significant determination.

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
Aesthetics and Visual Resources			
2025	**Significant Impact (same[2])** – Alternative 1 would result in the following significant impacts in 2025 for **AES-1** substantially adverse effects on scenic vistas; **AES-2** substantially damage scenic resources, including but not limited to trees, rocks, outcroppings, and historic structures within a state scenic highway; **AES-3** substantially degrade the existing visual character or quality of public views of the site and its surroundings, including adding a visual element of urban character to an existing rural or open space area, conflicting with regulations governing scenic quality; and **AES-4** substantially degrade the existing visual character or quality of public views of	**Significant Impact (increased)** – Alternative 2 would result in the following significant impacts in 2025: **AES-1**, **AES-2**, **AES-3**, and **AES-4**. Impacts would be greater than the proposed Plan in 2025 because growth and land use patterns would result in more growth in less developed areas of the region, and more highway-related transportation network improvements would occur compared to the proposed Plan.	**Significant Impact (decreased)** – Alternative 3 would result in the following significant impacts in 2025: **AES-1**, **AES-2**, **AES-3,** and **AES-4**. Impacts would be reduced compared to the proposed Plan in 2025. This alternative would result in more compact development patterns compared to the proposed Plan, which would result in reduced impacts on scenic vistas, scenic highways, and visual character in rural and less developed areas of the region. Also, transportation network improvements would involve less highway-related projects than the proposed Plan.

[2] For purposes of Table 6-3, "same" means same or closely similar impact.

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	the site and its surroundings by creating a new source of substantial light or glare that would adversely affect day or nighttime views. Impacts would be the same as the proposed Plan in 2025 because forecasted growth and land use change and transportation network improvements and programs in place by 2025 would be similar to the proposed Plan.		
2035	**Significant Impact (same)** – Impacts **AES-1**, **AES-2**, **AES-3**, and **AES-4** would be significant in 2035, and the same as the proposed Plan. The rationale described under 2025 also applies to 2035.	**Significant Impact (increased)** – Impacts **AES-1**, **AES-2**, **AES-3**, and **AES-4** would be significant in 2035, and greater than the proposed Plan. The rationale described under 2025 also applies to 2035.	**Significant Impact (decreased)** – Impacts **AES-1**, **AES-2**, **AES-3**, and **AES-4** would be significant in 2035 and would be decreased compared to proposed Plan impacts. The rationale described under 2025 also applies to 2035.
2050	**Significant Impact (same)** – Impacts **AES-1**, **AES-2**, **AES-3**, and **AES-4** would be significant in 2035, and the same as the proposed Plan. The rationale described under 2025 also applies to 2050.	**Significant Impact (increased)** – Impacts **AES-1**, **AES-3**, and **AES-4** would be significant in 2035, and greater than the proposed Plan. Impact **AES-2** would be significant and less than the proposed Plan. The rationale described for 2025 applies to 2050.	**Significant Impact (decreased)** – Impacts **AES-1**, **AES-2**, **AES-3**, and **AES-4** would be significant in 2035 and considered the same as the proposed Plan impacts. The rationale described under 2025 also applies to 2050.
Agriculture and Forestry Resources			
2025	**Significant Impact (increased)** – Alternative 1 would result in significant impacts on agricultural and forest resources. **AG-1** would occur due to conversion of agricultural lands to nonagricultural use, **AG-2** would occur as a result of conflict with land zoned for agricultural use or with Williamson Act contracts, and **AG-3** would result from	**Significant Impact (increased)** – Alternative 2 would result in significant impacts on agricultural and forest resources (**AG-1**, **AG-2**, and **AG-3**). The impacts would be increased compared to the proposed Plan in 2025 because Alternative 2 land use would not be as concentrated in urban areas as the proposed Plan and would result in more land	**Significant Impact (decreased) –** Alternative 3 would result in a significant impact on agricultural and forest resources (**AG-1**, **AG-2**, and **AG-3**). The impact would be decreased compared to the proposed Plan in 2025 because Alternative 3 land use would be denser in urban areas than the

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	direct loss of forest land. The impacts would be increased compared to the proposed Plan in 2025 because Alternative 1 land use would not be as concentrated in urban areas as the proposed Plan and would result in more land use conflict with agricultural and forest resources.	use conflict with agricultural and forest resources.	proposed Plan and would result in less land use conflict with agricultural resources.
2035	**Significant Impact (increased)** – Alternative 1 would result in significant impacts on agricultural and forest resources (**AG-1**, **AG-2**, and **AG-3**). The impacts would be increased compared to the proposed Plan in 2035 because Alternative 1 land use would not be as concentrated in urban areas as the proposed Plan and would result in more land use conflict with agricultural and forest resources.	**Significant Impact (increased)** – Alternative 2 would result in significant impacts on agricultural and forest resources (**AG-1**, **AG-2**, and **AG-3**). The impacts would be increased compared to the proposed Plan in 2025 because Alternative 2 land use would not be as concentrated in urban areas as the proposed Plan and would result in more land use conflict with agricultural and forest resources.	**Significant Impact (decreased) –** Alternative 3 would result in a significant impact on agricultural and forest resources (**AG-1**, **AG-2**, and **AG-3**). The impact would be less compared to the proposed Plan in 2035 because Alternative 3 land use would be denser in urban areas than the proposed Plan and would result in less land use conflict with agricultural resources.
2050	**Significant Impact (increased)** – Alternative 1 would result in significant impacts on agricultural and forest resources (**AG-1**, **AG-2**, and **AG-3**). The impacts would be increased compared to the proposed Plan in 2050 because Alternative 1 land use would not be as concentrated in urban areas as the proposed Plan and would result in more land use conflict with agricultural and forest resources.	**Significant Impact (increased)** – Alternative 2 would result in significant impacts on agricultural and forest resources (**AG-1**, **AG-2**, and **AG-3**). The impacts would be increased compared to the proposed Plan in 2025 because Alternative 2 land use would not be as concentrated in urban areas as the proposed Plan and would result in more land use conflict with agricultural and forest resources.	**Significant Impact (decreased) –** Alternative 3 would result in a significant impact on agricultural and forest resources (**AG-1**, **AG-2**, and **AG-3**The impact would be less compared to the proposed Plan in 2050 because Alternative 3 land use would be denser in urban areas than the proposed Plan and would result in less land use conflict with agricultural resources.
Air Quality			
2025	**Less-than-Significant Impact (same)** – Alternative 1 would result in a less-than-	**Less-than-Significant Impact (same)** – Alternative 2 would result in a less-than-	**Less-than-Significant Impact (same)** – Alternative 3 would result in a less-than-

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	significant impact in 2025 for **AQ-1**, conflict with or obstruct implementation of applicable Air Quality Attainment Plans. As with the proposed Plan, this alternative would also be consistent with the 2016 SIP, 2016 RAQS, and the 2020 SIP.	significant impact in 2025 for **AQ-1**. As with the proposed Plan, this alternative would also be consistent with the 2016 Sip, 2016 RAQS, and the 2020 SIP.	significant impact in 2025 for **AQ-1**. As with the proposed Plan, this alternative would also be consistent with the 2016 SIP, 2016 RAQS, and the 2020 SIP.
	Less-than-Significant Impact (increased) – – Alternative 1 would result in a less-than-significant impact in 2025 for **AQ-2**, result in a cumulatively considerable net increase in nonattainment or attainment criteria pollutants, including VOC, NO_X, CO, PM10, and PM2.5, and SO_X. While Alternative 1 would cause an increase in ROG, NO_X, CO, PM2.5 and PM10 emissions compared to the proposed Plan, Alternative 1 would result in less emissions than the baseline (2016) conditions; refer to Appendix O, Table 0-4. Additionally, Alternative 1 may result in lower SO_X emissions compared to the proposed Plan due to lower diesel fuel consumption. Therefore, Alternative 1 would result in increased criteria emissions, except SO_X, when compared to the proposed Plan. Impacts would still be less than significant compared to baseline conditions.	**Less-than-Significant Impact (increased)** – Alternative 2 would result in a less-than-significant impact in 2025 for **AQ-2**. Alternative 2 would cause an increase in emissions compared to the proposed Plan but would result in less emissions than the baseline (2016) conditions; refer to Appendix O, Table 0-4. Therefore, Alternative 2 would result in increased emissions compared to the proposed Plan and impacts would be less than significant.	**Less-than-Significant Impact (decreased)** – Alternative 3 would result in a less-than-significant impact in 2025 for **AQ-2**. Alternative 3 would have lower emissions compared to the proposed Plan and not result in cumulatively considerable net increase in any nonattainment or attainment criteria pollutant, similar to the proposed Plan; refer to Appendix O, Table O-4. Thus, Alternative 3 would lower emissions and cause a less-than- significant impact.
	Significant Impact (same) – Alternative 1 would result in a significant impact in 2025 for **AQ-3**, result in construction-related emissions above mass emission thresholds.	**Significant Impact (same)** – Alternative 2 would result in a significant impact in 2025 for **AQ-3**. Alternative 2 would result in similar construction-related emissions	**Significant Impact (same)** – Alternative 3 would result in a significant impact in 2025 for **AQ-3**. Alternative 3 would result in similar construction-related emissions

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	Alternative 1 would result in similar construction-related emissions compared to the proposed Plan, and would result in similar impacts.	compared to the proposed Plan, and would result in similar impacts.	compared to the proposed Plan, and would result in similar impacts.
	Significant Impact (increased) – Alternative 1 would result in a significant impact in 2025 for **AQ-4**, expose sensitive receptors to substantial PM10 and PM2.5 concentrations. As shown in Appendix O, Table O-4, Alternative 1 would result in higher PM10 and PM2.5 emissions compared to the proposed Plan. Thus, Alternative 1 would have higher PM10 concentration impacts compared to the proposed Plan and would also result in a similar significant impact.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2025 for **AQ-4**. As shown in Appendix O, Table O-4, Alternative 2 would result in higher PM10 and PM2.5 emissions compared to the proposed Plan. Thus, Alternative 2 would have higher PM10 concentration impacts compared to the proposed Plan and would also result in a similar significant impact.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact in 2025 for **AQ-4**. Alternative 3 would result in a small decrease of PM10 and PM2.5 emissions compared to the proposed Plan; refer to Appendix O, Table O-4. However, PM10 concentration impacts would be similar to the proposed Plan and would result in a similar significant impact.
	Significant Impact (decreased) – Alternative 1 would result in a significant impact in 2025 for **AQ-5,** expose sensitive receptors to substantial TAC concentrations. Alternative 1 would result in similar population growth as the proposed Plan, but would not result in focused growth in Mobility Hubs and would not include the diesel commuter rail lines. However, Alternative 1 would result in higher per capita and overall VMT, which could increase TACs from roadways. Overall, while diesel exposure due to commuter rail lines would decrease, this could be offset by an increase	**Significant Impact (decreased)** – Alternative 2 would result in a significant impact in 2025 for **AQ-5,** expose sensitive receptors to substantial TAC concentrations. Alternative 2 would result in similar population growth as the proposed Plan, but would not result in focused growth in Mobility Hubs and would not include the diesel commuter rail lines. However, Alternative 2 would result in higher per capita and overall VMT, which could increase TACs from roadways. Overall, while diesel exposure due to commuter rail lines would decrease, this could be offset by an increase	**Significant Impact (same)** – Alternative 3 would result in a significant impact in 2025 for **AQ-5,** expose sensitive receptors to substantial TAC concentrations. Alternative 3 would result in similar population growth as the proposed Plan, but would focus all growth in the Mobility Hubs and would include the diesel commuter rail lines. While emissions and associated health risk from the commuter rail lines would be similar, the increase in population in the Mobility Hubs may increase the amount of people exposed to this increased cancer risk compared to the proposed Plan. Moreover,

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	in roadways TACs due to increased onroad VMT. Thus, Alternative 1 would have lower TACs compared to the proposed Plan, but result in a similar significant impact.	in roadways TACs due to increased onroad VMT. Thus, Alternative 2 would have lower TACs compared to the proposed Plan, but result in a similar significant impact.	Alternative 3 would result in lower per capita and overall VMT, which could decrease TACs from roadways. Overall, while diesel exposure due to commuter rail lines would be the same, more people could be exposed in Mobility Hubs, and the decrease in VMT could offset some of this increase in commuter rail TACs. Overall, Alternative 3 would have similar TACs compared to the proposed Plan, but result in a similar significant impact.
	Less-than-Significant Impact (increased) – Alternative 1 would result in following less-than-significant impact in 2025 for **AQ-6** expose sensitive receptors to substantial concentrations of CO. According to Appendix O, Table O-4, Alternative 1 would result in higher winter CO emissions compared to the proposed Plan. However, these CO emissions would be substantially less than the baseline (2016) conditions. Thus, exposure of sensitive receptors to CO concentrations would increase under Alternative 1 as under the proposed Plan but still result in a less-than-significant impact.	**Less-than-Significant Impact (increased) –** Alternative 2 would result in the following less-than-significant impact in 2025 for **AQ-6**. According to Appendix O, Table O-4, Alternative 2 would result in higher winter CO emissions compared to the proposed Plan. However, these CO emissions would be substantially less than the baseline (2016) conditions. Thus, exposure of sensitive receptors to CO concentrations would increase under Alternative 2 compared to the proposed Plan but still result in a less-than-significant impact.	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in a less-than-significant impact in 2025 for **AQ-6**. As shown in Appendix O, Table O-4, Alternative 3 would result in lower winter CO emissions compared to the Proposed Plan. Thus, exposure of sensitive receptors to CO concentrations would decrease under Alternative 3 as under the proposed Plan and be substantially below the baseline (2016) conditions. This would be a less-than-significant impact.
	Less-than-Significant Impact (same) – Alternative 1 would result in the following less-than-significant impact in 2025: **AQ-7** expose a substantial number of people to objectionable odors. As shown in Appendix O,	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2025 for **AQ-7**. Alternative 2 would employ similar construction methods as the proposed Plan	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2025 for **AQ-7**. Exposure of people to objectionable odors would be the same under Alternative 3 as

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	Table O-1, Alternative 1 would not promote the construction of typical land uses that cause odor impacts. Alternative 1 would also have similar construction impacts as the proposed Plan and thus similar construction odor impacts. Furthermore, proposed land uses under Alternative 1 would be required to comply with all SDAPCD, city, county, and other odor rules, regulations and programs.	and thus similar construction odor impacts. Furthermore, proposed land uses within Alternative 2 would be required to comply with all SDAPCD, city, county, and other odor rules, regulations and programs. Thus, Alternative 2 would result in similar odor impacts.	under the proposed Plan because Alternative 3 would employ similar construction methods and have similar proposed land uses as the proposed Plan. Furthermore, Alternative 3 would be required to comply with all SDAPCD, city, county, and other odor rules, regulations and programs. Thus, Alternative 3 would result in similar Less-than-Significant odor impacts.
2035	**Less-than-Significant Impact (same)** – Alternative 2 would result in a less-than-significant impact in 2035 for **AQ-1**. As with the proposed Plan, this alternative would be consistent with the 2016 SIP, 2016 RAQS, and the 2020 SIP.	**Less-than-Significant Impact (same)** – Alternative 2 would result in a less-than-significant impact in 2035 for **AQ-1**. As with the proposed Plan, this alternative would be consistent with the 2016 SIP, 2016 RAQS, and the 2020 SIP	**Less-than-Significant Impact (same)** – Alternative 3 would result in a less-than-significant impact in 2025 for **AQ-1**. As with the proposed Plan, this alternative would be consistent with the 2016 SIP, 2016 RAQS, and the 2020 SIP.
	Less-than-Significant Impact (increased) – Alternative 1 would result in a less-than-significant impact in 2035 for **AQ-2**~~,~~. While Alternative 1 would cause an increase in onroad emissions compared to the proposed Plan, Alternative 1 would result in less emissions than the baseline (2016) conditions; refer to Appendix O, Table 0-4. Therefore, Alternative 1 would result in increased emissions compared to the proposed Plan, but because emissions would be lower than baseline (2016) conditions impacts would be less than significant.	**Less-than-Significant Impact (increased)** – Alternative 2 would result in a less-than-significant impact in 2035 for **AQ-2**. Alternative 2 would cause an increase in onroad emissions compared to the proposed Plan but would result in less emissions than the baseline (2016) conditions; refer to Appendix O, Table 0-4. Therefore, Alternative 2 would result in increased emissions compared to the proposed Plan, but because emissions would be lower than baseline (2016) conditions, impacts would still be less than significant.	**Less-than-Significant Impact (decreased)** – Alternative 3 would result in a less-than-significant impact in 2035 for **AQ-2**. Alternative 3 would have lower VMT and emissions from onroad sources (with the exception of a 0.01-ton-per-day increase in summer NO_X in 2025), but similar emissions from commuter rail compared to the proposed Plan. While Alternative 3 would result in a decrease in ROG, NO_X, CO, PM2.5, PM10, and SO_X emissions compared to the proposed Plan from onroad sources, and overall emissions would be similar to the proposed Plan. Alternative 3 would not

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
			result in cumulatively considerable net increase in any nonattainment or attainment criteria pollutant, similar to the proposed Plan; refer to Appendix O, Table O-4. Thus, Alternative 3 would lower emissions and have a less-than-significant impact.
	Significant Impact (same) – Alternative 1 would result in a significant impact in 2035 for **AQ-3**. Alternative 1 would result in similar construction-related emissions compared to the proposed Plan, and would result in similar impacts.	**Significant Impact (same)** – Alternative 2 would result in a significant impact in 2035 for **AQ-3**. Alternative 2 would result in similar construction-related emissions compared to the proposed Plan, and would result in similar impacts.	**Significant Impact (same)** – Alternative 3 would result in a significant impact in 2035 for **AQ-3**. Alternative 3 would result in similar construction-related emissions compared to the proposed Plan, and would result in similar impacts.
	Significant Impact (increased) – Alternative 1 would result in a significant impact in 2035 for **AQ-4**, expos e sensitive receptors to substantial PM10 and PM2.5 concentrations. As shown in Appendix O, Table O-4, Alternative 1 would result in higher PM10 and PM2.5 emissions compared to the proposed Plan. Thus, Alternative 1 would have higher PM10 concentration impacts compared to the proposed Plan and would also result in a similar significant impact.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2035 for **AQ-4**, expose sensitive receptors to substantial PM10 and PM2.5 concentrations. As shown in Appendix O Table O-4, Alternative 2 would result in higher PM10 and PM2.5 emissions compared to the proposed Plan. Thus, Alternative 2 would have higher PM10 concentration impacts compared to the proposed Plan and would also result in a similar significant impact.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact in 2035 for **AQ-4**. Alternative 3 would result in a small decrease of PM10 and PM2.5 emissions compared to the proposed Plan; refer to Appendix O, Table O-4. However, PM10 concentration impacts would similar to the proposed Plan and would result in a similar significant impact.
	Significant Impact (decreased) – Alternative 1 would result in a significant impact in 2035 for **AQ-5,** expose sensitive receptors to substantial TAC concentrations. Alternative 1 would result in similar	**Significant Impact (decreased)** – Alternative 2 would result in a significant impact in 2035 for **AQ-5,** expose sensitive receptors to substantial TAC concentrations. Alternative 2 would result in similar	**Significant Impact (same)** – Alternative 3 would result in a significant impact in 2035 for **AQ-5,** expose sensitive receptors to substantial TAC concentrations. Alternative 3 would result in similar population growth

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	population growth as the proposed Plan, but would not result in focused growth in Mobility Hubs and would not include the diesel commuter rail lines. However, Alternative 1 would result in higher per capita and overall VMT, which could increase TACs from roadways. Overall, while diesel exposure due to commuter rail lines would decrease, this could be offset by an increase in roadways TACs due to increased on-road VMT. Thus, Alternative 1 would have lower TACs compared to the proposed Plan, result in a similar significant impact.	population growth as the proposed Plan, but would not result in focused growth in Mobility Hubs and would not include the diesel commuter rail lines. However, Alternative 2 would result in higher per capita and overall VMT, which could increase TACs from roadways. Overall, while diesel exposure due to commuter rail lines would decrease, this could be offset by an increase in roadways TACs due to increased on-road VMT. Thus, Alternative 2 would have lower TACs compared to the proposed Plan, result in a similar significant impact.	as the proposed Plan, but would focus all growth in the Mobility Hubs and would include the diesel commuter rail lines. While emissions and associated health risk from the commuter rail lines would be similar, the increase in population in the Mobility Hubs may increase the amount of people exposed to this increased cancer risk compared to the proposed Plan. Moreover, Alternative 3 would result in lower per capita and overall VMT, which could decrease TACs from roadways. Overall, while diesel exposure due to commuter rail lines would be the same, more people could be exposed in Mobility Hubs, and the decrease in VMT could offset some of this increase in commuter rail TACs. Overall, Alternative 3 would have similar TACs compared to the proposed Plan, result in a similar significant impact.
	Less-than-Significant Impact (increased) – Alternative 1 would result in a less-than-significant impact in 2035 for **AQ-6**. According to Appendix O, Table O-4, Alternative 1 would result in higher winter CO emissions compared to the proposed Plan. However, these CO emissions would be substantially less than the baseline (2016) conditions. Thus, exposure of sensitive receptors to CO concentrations would increase under Alternative 1 as under the	**Less-than-Significant Impact (increased) –** Alternative 2 would result in a less-than-significant impact in 2035 for **AQ-6**. According to Appendix O, Table O-4, Alternative 2 would result in higher winter CO emissions compared to the proposed Plan. However, these CO emissions would be substantially less than the baseline (2016) conditions. Thus, exposure of sensitive receptors to CO concentrations would increase under Alternative 2 as under the	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in a less-than-significant impact in 2035 for **AQ-6**. As shown in Appendix O, Table O-4, Alternative 3 would result in lower winter CO emissions compared to the Proposed Plan. Thus, exposure of sensitive receptors to CO concentrations would decrease under Alternative 3 as under the proposed Plan and be substantially below the baseline

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	proposed Plan but still result in a less-than-significant impact.	proposed Plan but still result in a less-than-significant impact.	(2016) conditions. This would be a less-than-significant impact.
	Less-than-Significant Impact (same) – Alternative 1 would result in a less-than-significant impact in 2035 for **AQ-7**. Exposure of people to objectionable odors would be the same under Alternative 1 as Alternative 1 would not promote the construction of typical land uses that cause odor impacts. Alternative 1 would have similar construction impacts as the proposed Plan and thus similar construction odor impacts. Furthermore, Alternative 1 would be required to comply with all SDAPCD, city, county, and other odor rules, regulations and programs.	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2035 for **AQ-7**. Exposure of people to objectionable odors would be the same under Alternative 2 as under the proposed Plan because Alternative 2 would use similar construction methods and have similar land uses as the proposed Plan. Furthermore, Alternative 2 would also be required to comply with all SDAPCD, city, county, and other odor rules, regulations and programs. Thus, Alternative 2 would result in similar less-than-significant odor impacts	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2035 for **AQ-7**. Exposure of people to objectionable odors would be the same under Alternative 3 as under the proposed Plan because Alternative 3 would use similar construction methods and have similar land uses as the proposed Plan. Furthermore, Alternative 3 would also be required to comply with all SDAPCD, city, county, and other odor rules, regulations and programs. Thus, Alternative 3 would result in similar less-than-significant odor impacts.
2050	**Less-than-Significant Impact (same)** – Alternative 1 would result in a less-than-significant impact in 2050 for **AQ-1**. As with the proposed Plan, this alternative would be consistent with the 2016 SIP, 2016 RAQS, and the 2020 SIP.	**Less-than-Significant Impact (same)** – Alternative 2 would result in a less-than-significant impact in 2050 for **AQ-1**. As with the proposed Plan, this alternative would be consistent with the 2016 SIP, 2016 RAQS, and the 2020 SIP.	**Less-than-Significant Impact (same)** – Alternative 3 would result in a less-than-significant impact in 2050 for **AQ-1**. As with the proposed Plan, this alternative would be consistent with the 2016 SIP, 2016 RAQS, and the 2020 SIP.
	Significant Impact (increased) – Alternative 1 would result in a significant impact in 2050 for **AQ-2**. While Alternative 1 would cause an increase in onroad emissions compared to the proposed Plan, Alternative 1 would result in less emissions than the baseline (2016) conditions; refer to Appendix O, Table 0-4. Therefore, Alternative 1 would	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2050 for **AQ-2** for PM10 and SO_X. While Alternative 2 would result in an increase in ROG, NO_X, CO, PM2.5 and PM10 emissions compared to the proposed Plan, Alternative 2 would result in less emissions than the baseline (2016) conditions; refer to	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact in 2050 for **AQ-2**. Alternative 3 would have lower VMT and emissions from onroad sources, but similar emissions from commuter rail compared to the proposed Plan. While Alternative 3 would result in a decrease in ROG, NO_X, CO, PM2.5, PM10, and

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	result in increased emissions compared to the proposed Plan, but because emissions would be lower than baseline (2016) conditions impacts would still be significant compared to baseline conditions.	Appendix O, Table 0-4. Therefore, Alternative 2 would result in increased emissions when compared to the proposed Plan. Impacts would still be significant compared to baseline conditions.	SO_X emissions compared to the proposed Plan from onroad sources, and overall emissions would be similar to the proposed Plan, Alternative 3 would result in cumulatively considerable net increase in any nonattainment or attainment criteria pollutant, similar to the proposed Plan; refer to Appendix O, Table O-4. Thus, while Alternative 3 would lower emissions, it would still result in a significant impact.
	No Impact (Decreased) – Alternative 1 would result in no impact in 2050 for **AQ-3**. Alternative 1 would not have any construction-related emissions in 2050 and thus would have substantially lower construction-related emissions compared to the proposed Plan. Impacts would be decreased.	**Significant Impact (same)** – Alternative 2 would result in a significant impact in 2050 for **AQ-3**. Alternative 2 would result in similar construction-related emissions compared to the proposed Plan, and would result in similar impacts.	**Significant Impact (same)** – Alternative 3 would result in a significant impact in 2050 for **AQ-3**. Alternative 3 would result in similar construction-related emissions compared to the proposed Plan, and would result in similar impacts.
	Significant Impact (Increased) – Alternative 1 would result in a significant impact in 2050 for **AQ-4**, expose sensitive receptors to substantial PM10 and PM2.5 concentrations. As shown in Appendix O, Table O-4, Alternative 1 would result in higher PM10 and PM2.5 emissions compared to the proposed Plan. Thus, Alternative 1 would have higher PM10 concentrations compared to the proposed Plan and would also result in a similar significant impact.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2050 for **AQ-4**, expose sensitive receptors to substantial PM10 and PM2.5 concentrations. As shown in Appendix O, Table O-4, Alternative 2 would result in higher PM10 and PM2.5 emissions compared to the proposed Plan. Thus, Alternative 1 would have higher PM10 concentrations compared to the proposed Plan and would also result in a similar significant impact.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact in 2050 for **AQ-4**, expose sensitive receptors to substantial PM10 and PM2.5 concentrations. Alternative 3 would result in a small decrease of PM10 and PM2.5 emissions compared to the proposed Plan; refer to Appendix O, Table O-4. However, PM10 concentration impacts would be similar to the proposed Plan and would result in a similar significant impact.

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	Significant Impact (decreased) – Alternative 1 would result in a significant impact in 2050 for **AQ-5,** expose sensitive receptors to substantial TAC concentrations. Alternative 1 would result in similar population growth as the proposed Plan, but would not result in focused growth in Mobility Hubs and would not include the diesel commuter rail lines. However, Alternative 1 would result in higher per capita and overall VMT, which could increase TACs from roadways. Overall, while diesel exposure due to commuter rail lines would decrease, this could be offset by an increase in roadways TACs due to increased on-road VMT. Thus, Alternative 1 would have lower TACs compared to the proposed Plan, result in a similar significant impact.	**Significant Impact (decreased)** – Alternative 2 would result in a significant impact in 2050 for **AQ-5,** expose sensitive receptors to substantial TAC concentrations. Alternative 2 would result in similar population growth as the proposed Plan, but would not result in focused growth in Mobility Hubs and would not include the diesel commuter rail lines. However, Alternative 2 would result in higher per capita and overall VMT, which could increase TACs from roadways. Overall, while diesel exposure due to commuter rail lines would decrease, this could be offset by an increase in roadways TACs due to increased on-road VMT. Thus, Alternative 2 would have lower TACs compared to the proposed Plan, result in a similar significant impact.	**Significant Impact (same)** – Alternative 3 would result in a significant impact in 2050 for **AQ-5,** expose sensitive receptors to substantial TAC concentrations. Alternative 3 would result in similar population growth as the proposed Plan, but would focus all growth in the Mobility Hubs and would include the diesel commuter rail lines. While emissions and associated health risk from the commuter rail lines would be similar, the increase in population in the Mobility Hubs may increase the amount of people exposed to this increased cancer risk compared to the proposed Plan. Moreover, Alternative 3 would result in lower per capita and overall VMT, which could decrease TACs from roadways. Overall, while diesel exposure due to commuter rail lines would be the same, more people could be exposed in Mobility Hubs, and the decrease in VMT could offset some of this increase in commuter rail TACs. Overall, Alternative 3 would have similar TACs compared to the proposed Plan, result in a similar significant impact.
	Less-than-Significant Impact (Increased) – Alternative 1 would result in a less-than-significant impact in 2050 for **AQ-6**. According to Appendix O, Table O-4, Alternative 1 would result in higher winter	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2050 for **AQ-6** expose sensitive receptors to substantial concentrations of CO. According to Appendix	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in a less-than-significant impact in 2050 for **AQ-6** expose sensitive receptors to substantial concentrations of CO. As shown in Appendix

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	CO emissions compared to the proposed Plan. However, these CO emissions would be substantially less than the baseline (2016) conditions. Thus, exposure of sensitive receptors to CO concentrations would increase under Alternative 1 as under the proposed Plan but still result in a less-than-significant impact.	O, Table O-4, Alternative 2 would result in higher winter CO emissions compared to the proposed Plan. However, these CO emissions would be substantially less than the baseline (2016) conditions. Thus, exposure of sensitive receptors to CO concentrations would increase under Alternative 1 as under the proposed Plan but still result in a less-than-significant impact.	O, Table O-4, Alternative 3 would result in lower winter CO emissions compared to the Proposed Plan. Thus, exposure of sensitive receptors to CO concentrations would decrease under Alternative 3 as under the proposed Plan and be substantially below the baseline (2016) conditions. This would be a less-than-significant impact.
	Less-than-Significant Impact (decreased) – Alternative 1 would result in a less-than-significant impact in 2050 for **AQ-7**. Exposure of people to objectionable odors would be the decreased under Alternative 1 as Alternative 1 would not have any construction emissions or construction-related odor impacts. Furthermore, build-out land uses under Alternative 1 would be required to comply with all SDAPCD, city, county, and other odor rules, regulations and programs.	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2050 for **AQ-7** expose a substantial number of people to objectionable odors. Exposure of people to objectionable odors would be the same under Alternative 2 as under the proposed Plan because Alternative 2 would use similar construction methods and have similar land uses as the proposed Plan. Furthermore, Alternative 2 would also be required to comply with all SDAPCD, city, county, and other odor rules, regulations and programs. Thus, Alternative 2 would result in similar less-than-significant odor impacts.	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2050 for **AQ-7** expose a substantial number of people to objectionable odors. Exposure of people to objectionable odors would be the same under Alternative 3 as under the proposed Plan because Alternative 3 would use similar construction methods and have similar land uses as the proposed Plan. Furthermore, Alternative 3 would also be required to comply with all SDAPCD, city, county, and other odor rules, regulations and programs. Thus, Alternative 3 would result in similar less-than-significant odor impacts.

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Biological Resources			
2025	**Significant Impact (increased)** – Alternative 1 would result in a significant impact on biological resources due to adverse effects on sensitive natural communities and regulated aquatic resources (**BIO-1**); adverse effects on candidate, sensitive, endangered, rare, threatened, or special status species (**BIO-**2); and substantial interference with wildlife movement (**BIO-3**). The impacts of Alternative 1 in 2025 would be greater than proposed Plan impacts because there would be less compact development in the region and more impact on natural communities, plant and animal species, and wildlife movement.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on biological resources for **BIO-1**, **BIO-2**, and **BIO-3**. The impacts of Alternative 2 in 2025 would be greater than proposed Plan impacts because there would be less compact development in the region and more impact on natural communities, plant and animal species, and wildlife movement.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on biological resources for **BIO-1**, **BIO-2**, and **BIO-3**. The impacts of Alternative 3 in 2025 would be less than proposed Plan impacts because there would be more compact development around mobility hubs in the region and less impact on natural communities, plant and animal species, and wildlife movement.
	Less-than-Significant Impact (same) – Alternative 1 would result in the following less-than-significant impact in 2025 for **BIO-4** conflict with the provisions of an adopted HCP, NCCP, or other conservation plan, or with any local policies or ordinances protecting biological resources. Encroachment into hardline preserve areas would require biologically equivalent or superior compensation of habitat or project redesign, the same as the proposed Plan.	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2025 (**BIO-4**). Encroachment into hardline preserve areas would require biologically equivalent or superior compensation of habitat or project redesign, the same as the proposed Plan.	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2025 (**BIO-4).** Encroachment into hardline preserve areas would require biologically equivalent or superior compensation of habitat or project redesign, the same as the proposed Plan.
2035	**Significant Impact (increased)** – Alternative 1 would result in a significant impact on biological resources for **BIO-1**,	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on biological resources for **BIO-1**,	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on biological resources for **BIO-1**,

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	BIO-2, and **BIO-3**. The impacts of Alternative 1 in 2035 would be greater than proposed Plan impacts because there would be less compact development in the region and more impacts on natural communities, plant and animal species, and wildlife movement.	**BIO-2**, and **BIO-3**. The impacts of Alternative 2 in 2035 would be greater than proposed Plan impacts because there would be less compact development in the region and more impacts on natural communities, plant and animal species, and wildlife movement.	**BIO-2**, and **BIO-3**. The impacts of Alternative 3 in 2025 would be less than proposed Plan impacts because there would be more compact development in the region around mobility hubs, and less impacts on natural communities, plant and animal species, and wildlife movement.
	Less-than-Significant Impact (same) – Alternative 1 would result in a less-than-significant impact in 2035 (**BIO-4**). Encroachment into hardline preserve areas would require biologically equivalent or superior compensation of habitat or project redesign, the same as the proposed Plan.	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2035 (**BIO-4**). Encroachment into hardline preserve areas would require biologically equivalent or superior compensation of habitat or project redesign, the same as the proposed Plan.	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2035 (**BIO-4**). Encroachment into hardline preserve areas would require biologically equivalent or superior compensation of habitat or project redesign, the same as the proposed Plan.
2050	**Significant Impact (increased)** – Alternative 1 would result in a significant impact on biological resources for **BIO-1**, **BIO-2**, and **BIO-3**. The impacts of Alternative 1 in 2050 would be greater than proposed Plan impacts because there would be less compact development in the region and more impacts on natural communities, plant and animal species, and wildlife movement.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on biological resources for **BIO-1**, **BIO-2**, and **BIO-3**. The impacts of Alternative 2 in 2050 would be greater than proposed Plan impacts because there would be less compact development in the region and more impacts on natural communities, plant and animal species, and wildlife movement.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on biological resources for **BIO-1**, **BIO-2**, and **BIO-3**. The impacts of Alternative 3 in 2025 would be less than proposed Plan impacts because there would be more compact development in the region around mobility hubs and less impacts on natural communities, plant and animal species, and wildlife movement.
	Less-than-Significant Impact (same) – Alternative 1 would result in a less-than-significant impact in 2050 (**BIO-4**). Encroachment into hardline preserve areas would require biologically equivalent or	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2050 (**BIO-4**). Encroachment into hardline preserve areas would require biologically equivalent or	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2050 (**BIO-4).** Encroachment into hardline preserve areas would require biologically equivalent or

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	superior compensation of habitat or project redesign, the same as the proposed Plan.	superior compensation of habitat or project redesign, the same as the proposed Plan.	superior compensation of habitat or project redesign, the same as the proposed Plan.
Cultural Resources			
2025	**Significant Impact (same)** – Alternative 1 would result in a significant impact on cultural resources due to substantial adverse change in the significance of a historical resource or unique archaeological resource (**CULT-1**). The impacts of Alternative 1 in 2025 would be similar to the proposed Plan due to ground-disturbing activities that could encounter and adversely affect historical or archaeological resources. Growth associated with Alternative 1 would be more spread-out in the region potentially resulting in more impacts to previously undisturbed land. However, there would be less disturbance due to transportation improvements; thus, the impact would be similar to the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on cultural resources (**CULT-1**). The impacts of Alternative 2 in 2025 would be increased compared to the proposed Plan due to ground-disturbing activities related to less compact growth and transportation improvements focused on highways rather than mobility hubs that could encounter and adversely affect historical or archaeological resources.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on cultural resources (**CULT-1**). The impacts of Alternative 3 in 2025 would be decreased compared to the proposed Plan because more compact development and less roadway and highway-related transportation improvements would occur, which would result in less ground-disturbing activities that could encounter and adversely affect historical or archaeological resources.
	Less-than-Significant Impact (same) – Alternative 1 would result in the following less-than-significant impact in 2025 for **CULT-2** disturb any human remains, including those interred outside of dedicated cemeteries, in violation of existing laws and regulations. Existing laws and regulations would continue to apply to Alternative 1, so	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2025 for **CULT-2**. Existing laws and regulations would continue to apply to Alternative 2, so the impact would be the same as the proposed Plan impact.	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2025 for **CULT-2**. Existing laws and regulations would continue to apply to Alternative 3, so the impact would be the same as the proposed Plan impact.

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	the impact would be the same as the proposed Plan impact.		
2035	**Significant Impact (decreased)** – Alternative 1 would result in a significant impact on cultural resources (**CULT-1**). The impacts of Alternative 1 in 2035 would be less than the proposed Plan because growth associated with Alternative 1 would be more spread-out in the region potentially resulting in more impacts to previously undisturbed land. However, there would be significantly less disturbance due to transportation improvements because there would be no new improvements beyond 2025 ; thus, the impact would be less than the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on cultural resources (**CULT-1**). The impacts of Alternative 2 in 2035 would be increased compared to the proposed Plan due to the ground-disturbing activities related to less compact growth and transportation improvements focused on highways rather than mobility hubs that could encounter and adversely affect historical or archaeological resources.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on cultural resources (**CULT-1**). The impacts of Alternative 3 in 2035 would be decreased compared to the proposed Plan because more compact development and less roadway and highway-related transportation improvements would occur, which would result in less ground-disturbing activities that could encounter and adversely affect historical or archaeological resources.
	Less-than-Significant Impact (same) – Alternative 1 would result in a less-than-significant impact in 2035 for **CULT-2**. Existing laws and regulations would continue to apply to Alternative 1, so the impact would be the same as the proposed Plan impact.	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2035 for **CULT-2**. Existing laws and regulations would continue to apply to Alternative 2, so the impact would be the same as the proposed Plan impact.	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2035 for **CULT-2**. Existing laws and regulations would continue to apply to Alternative 3, so the impact would be the same as the proposed Plan impact.
2050	**Significant Impact (decreased)** – Alternative 1 would result in a significant impact on cultural resources (**CULT-1**). The impacts of Alternative 1 in 2050 would be less than the proposed Plan because growth associated with Alternative 1 would be more spread-out in the region potentially resulting in more impacts to previously undisturbed	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on cultural resources (**CULT-1**). The impacts of Alternative 2 in 2050 would be increased compared to the proposed Plan due to the ground-disturbing activities related to less compact growth and transportation improvements focused on	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on cultural resources (**CULT-1**). The impacts of Alternative 3 in 2050 would be decreased compared to the proposed Plan because more compact development and less roadway and highway-related transportation improvements would occur,

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	land. However, there would be significantly less disturbance due to transportation improvements because there would be no new improvements beyond 2025 ; thus, the impact would be less than the proposed Plan	highways rather than mobility hubs that could encounter and adversely affect historical or archaeological resources.	which would result in less ground-disturbing activities that could encounter and adversely affect historical or archaeological resources.
	Less-than-Significant Impact (same) – Alternative 1 would result in a less-than-significant impact in 2050 for **CULT-2**. Existing laws and regulations would continue to apply to Alternative 1, so the impact would be the same as the proposed Plan impact.	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2050 for **CULT-2**. Existing laws and regulations would continue to apply to Alternative 2, so the impact would be the same as the proposed Plan impact.	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2050 for **CULT-2**. Existing laws and regulations would continue to apply to Alternative 3, so the impact would be the same as the proposed Plan impact.
Energy			
2025	**Less-than-Significant Impact (increased) –** Alternative 1 would result in the following less-than-significant impact in 2025 for **EN-1** result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy during project construction or operations. Existing State and regional regulations and programs to reduce energy use would continue to apply to Alternative 1; however, land use would not include as much multi-family development as under the proposed Plan. Thus, Alternative 1 would result in increased impacts.	**Less-than-Significant Impact (increased) –** Alternative 2 would result in a less-than-significant impact in 2025 (**EN-1**). Existing State and regional regulations and programs to reduce energy use would continue to apply to Alternative 2; however, land use would not include as much multi-family development as under the proposed Plan. Thus, Alternative 2 would result in increased impacts.	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in a less-than-significant impact in 2025 (**EN-1**). Existing State and regional regulations and programs to reduce energy use would continue to apply to Alternative 3; however, land use would include more dense development including multi-family development than under the proposed Plan. Thus Alternative 3 would result in decreased impacts.
	Less-than-Significant Impact (same) – Alternative 1 would result in the following less-than-significant impact in 2025 for **EN-2**	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2035 (**EN-2**). Alternative	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2025 (**EN-2**).

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	conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Alternative 1 would be consistent with adopted plans to address energy; thus, it would result in the same significant impact as the proposed Plan.	2 would be consistent with adopted plans to address energy; thus, it would result in the same significant impact as the proposed Plan.	Alternative 3 would be consistent with adopted plans to address energy; thus, it would result in the same significant impact as the proposed Plan.
2035	**Less-than-Significant Impact (increased) –** Alternative 1 would result in a less-than-significant impact in 2035 (**EN-1**). Existing State and regional regulations and programs to reduce energy use would continue to apply to Alternative 1; however, land use would not include as much multi-family development as under the proposed Plan. Thus, Alternative 1 would result in increased impacts.	**Less-than-Significant Impact (increased) –** Alternative 2 would result in a less-than-significant impact in 2035 (**EN-1**). Existing State and regional regulations and programs to reduce energy use would continue to apply to Alternative 2; however, land use would not include as much multi-family development as under the proposed Plan. Thus, Alternative 2 would result in increased impacts.	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in a less-than-significant impact in 2035 (**EN-1**). Existing State and regional regulations and programs to reduce energy use would continue to apply to Alternative 3; however, land use would include more dense development including multi-family development than under the proposed Plan. Thus, Alternative 3 would result in decreased impacts.
	Less-than-Significant Impact (same) – Alternative 1 would result in a less-than-significant impact in 2035 (**EN-2**). Alternative 1 would be consistent with adopted plans to address energy; thus, it would result in the same significant impact as the proposed Plan.	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2035 (**EN-2**). Alternative 2 would be consistent with adopted plans to address energy; thus, it would result in the same significant impact as the proposed Plan.	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2035 (**EN-2**). Alternative 3 would be consistent with adopted plans to address energy; thus, it would result in the same significant impact as the proposed Plan.
2050	**Less-than-Significant Impact (increased) –** Alternative 1 would result in a less-than-significant impact in 2050 (**EN-1**). Existing State and regional regulations and programs to reduce energy use would continue to apply to Alternative 1; however, land use would not	**Less-than-Significant Impact (increased) –** Alternative 2 would result in a less-than-significant impact in 2050 (**EN-1**). Existing State and regional regulations and programs to reduce energy use would continue to apply to Alternative 2; however, land use would not	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in a less-than-significant impact in 2050 (**EN-1**). Existing State and regional regulations and programs to reduce energy use would continue to apply to Alternative 3; however,

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	include as much multi-family development as under the proposed Plan. Thus, Alternative 1 would result in increased impacts.	include as much multi-family development as under the proposed Plan. Thus, Alternative 2 would result in an increase of impacts.	land use would include more dense development including multi-family development than under the proposed Plan. Thus, Alternative 3 would result in decreased impacts.
	Less-than-Significant Impact (same) – Alternative 1 would result in a less-than-significant impact in 2050 (**EN-2**). Alternative 1 would be consistent with adopted plans to address energy; thus, it would result in the same significant impact as the proposed Plan.	**Less-than-Significant Impact (same) –** Alternative 2 would result in a less-than-significant impact in 2050 (**EN-2**). Alternative 2 would be consistent with adopted plans to address energy; thus, it would result in the same significant impact as the proposed Plan.	**Less-than-Significant Impact (same) –** Alternative 3 would result in a less-than-significant impact in 2050 (**EN-2**). Alternative 3 would be consistent with adopted plans to address energy; thus, it would result in the same significant impact as the proposed Plan.
Geology, Soils, and Paleontological Resources			
2025	**Less-than-Significant Impact (same) –** The proposed Plan would result in the following less-than-significant impacts in 2025: **GEO-1** expose people or structures to potential substantial significant impacts, including the risk of loss, injury, or death involving: a) rupture of a known earthquake fault, b) strong seismic ground shaking; c) seismic-related ground failure, including liquefaction; and d) seismically-induced landslides; and **GEO-2** locate projects on a geologic unit or soil that is expansive or unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse; **GEO-3** result in substantial soil erosion or the loss of topsoil;	**Less-than-Significant Impact (same) –** The proposed Plan would result in less-than-significant impacts in 2025 (**GEO-1**, **GEO-2**, **GEO-3** and **GEO-4**). Alternative 2 would result in less-than-significant impacts due to adherence to applicable laws and regulations.	**Less-than-Significant Impact (same) –** The proposed Plan would result in less-than-significant impacts in 2025 (**GEO-1**, **GEO-2**, **GEO-3** and **GEO-4**). Alternative 3 would result in less-than-significant impacts due to adherence to applicable laws and regulations.

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	and **GEO-4** have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems, potentially causing adverse groundwater impacts. Alternative 1 would result in less-than-significant impacts due to adherence to applicable laws and regulations.		
	Significant Impact (same) – Alternative 1 would result in the following significant impact in 2025 for **PALEO-1** directly or indirectly destroy a unique paleontological resource or site or unique geological feature. Impacts would be same as the proposed Plan in 2025 because impacts from regional growth would be less compact than the proposed Plan, but there would be less transportation improvement projects proposed as part of Alternative 1; thus, the resulting impacts would be similar to the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in significant impact **PALEO-1** in 2025. Impacts would be increased compared to the proposed Plan in 2025 because impacts from regional growth and land use change would be less compact, and transportation network improvements and programs would include more roadway and highway improvements than the proposed Plan, which would result in increased potential to directly or indirectly destroy a unique paleontological resource or unique geological feature.	**Significant Impact (decreased)** – Alternative 3 would result in significant impact **PALEO-1** in 2025. Impacts would be less than the proposed Plan in 2025 because impacts from regional growth and land use change would be decreased due to more dense development around mobility hubs, and transportation network improvements and programs would include less highway and roadway improvements compared to the proposed Plan, which would result in les impacts to unique paleontological and geologic resources.
2035	**Less-than-Significant Impact (same) –** The proposed Plan would result in less-than-significant impacts in 2035 (**GEO-1**, **GEO-2**, **GEO-3** and **GEO-4**). Alternative 1 would result in less-than-significant impacts due to adherence to applicable laws and regulations.	**Less-than-Significant Impact (same) –** The proposed Plan would result in less-than-significant impacts in 2035 (**GEO-1**, **GEO-2**, **GEO-3** and **GEO-4**). Alternative 2 would result in less-than-significant impacts due to adherence to applicable laws and regulations.	**Less-than-Significant Impact (same)–** The proposed Plan would result in less-than-significant impacts in 2035 (**GEO-1**, **GEO-2**, **GEO-3** and **GEO-4**). Alternative 3 would result in less-than-significant impacts due to adherence to applicable laws and regulations.
	Significant Impact (decreased) – Alternative 1 would result in significant impact **PALEO-1** in 2035. Impacts would be	**Significant Impact (increased)** – Alternative 2 would result in significant impact **PALEO-1** in 2035. Impacts would be	**Significant Impact (decreased)** – Alternative 3 would result in significant impact **PALEO-1** in 2035. Impacts would be

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	less than the proposed Plan in 2035 because impacts from regional growth and land use change would be increased due to less compact development, but there would be no transportation improvements after 2025 as part of Alternative 1. Thus, the net impacts would be less than the proposed Plan.	increased compared to the proposed Plan in 2035 because impacts from regional growth and land use change would be increased due to less compact development, and transportation network improvements and programs would involve more roadway and highway improvements compared to the proposed Plan, which would result in increased potential to directly or indirectly destroy a unique paleontological resource or site or unique geological feature.	decreased compared to the proposed Plan in 2035 because impacts from regional growth and land use change would be decreased due to more dense development around mobility hubs, and transportation network improvements and programs would include less highway and roadway improvements compared to the proposed Plan, which would result in les impacts to unique paleontological and geologic resources.
2050	**Less-than-Significant Impact (same) –** The proposed Plan would result in less-than-significant impacts in 2050 (**GEO-1**, **GEO-2**, **GEO-3** and **GEO-4**). Alternative 1 would result in less-than-significant impacts due to adherence to applicable laws and regulations.	**Less-than-Significant Impact (same) –** The proposed Plan would result in less-than-significant impacts in 2050 (**GEO-1**, **GEO-2**, **GEO-3** and **GEO-4**). Alternative 2 would result in less-than-significant impacts due to adherence to applicable laws and regulations.	**Less-than-Significant Impact (same) –** The proposed Plan would result in less-than-significant impacts in 2050 (**GEO-1**, **GEO-2**, **GEO-3** and **GEO-4**). Alternative 3 would result in less-than-significant impacts due to adherence to applicable laws and regulations.
	Significant Impact (decreased) – Alternative 1 would result in significant impact **PALEO-1** in 2050. Impacts would be less than the proposed Plan in 2050 because impacts from regional growth and land use change would be increased due to less compact development, but there would be no transportation improvements after 2025 as part of Alternative 1. Thus, the net impacts would be less than the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in significant impact **PALEO-1** in 2050. Impacts would be greater than the proposed Plan in 2050 because impacts from regional growth and land use change would be greater due to less compact development, and transportation network improvements and programs would include more roadway and highway improvements compared to proposed Plan.	**Significant Impact (decreased)** – Alternative 3 would result in significant impact **PALEO-1** in 2050. Impacts would be less than the proposed Plan in 2050 because impacts from regional growth and land use change would decrease due to more compact development around mobility hubs, and transportation network improvements and programs would focus on more public transit projects rather than highway projects compared to the proposed Plan.

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Greenhouse Gas Emissions			
2025	**Less-than-Significant Impact (increased) –** Alternative 1 would result in the following less-than-significant impacts in 2025 for **GHG-1** directly or indirectly result in an increase in GHG emissions compared to existing conditions (2016)[3] and **GHG-4** conflict with or impede the implementation of local plans adopted for the purpose of reducing GHG emissions. As shown in Appendix O, Tables O-3 and O-4, under Alternative 1 in 2025, regional growth, land uses, and the transportation projects shown in Table O-1would result in higher GHG emissions than the proposed Plan in 2025 and would result in increased impacts.	**Less-than-Significant Impact (increased) –** Alternative 2 would result in less-than-significant impacts in 2025 (**GHG-1** and **GHG-4**). Regional growth, land uses, and transportation network improvements for Alternative 2 would result in higher GHG emissions than the proposed Plan and would result in increased impacts; refer to Appendix O, Tables O-3 and O-4.	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in less-than-significant impacts in 2025 (**GHG-1**and **GHG-4**). Regional growth, land uses, and transportation network improvements for Alternative 3 would result in lower GHG emissions than the proposed Plan due to more compact development, and would result in decreased impacts; refer to Appendix O, Tables O-3 and O-4.
	Significant Impact (increased) – Alternative 1 would result in a significant impact in 2030 for **GHG-5**, be inconsistent with the State's ability to achieve the 2030 reduction target of SB 32 and long-term reduction goals of Executive Orders S-3-05 and B-55-18. Alternative 1 would result in higher GHG emissions that would not meet the reduction target reference point for 2030	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2030 (**GHG-5**). Alternative 2 would result in higher GHG emissions that would not meet the reduction target reference point for 2030 and would result in increased impacts compared to the proposed Plan; refer to Appendix O, Tables O-3 and O-4.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact in 2030 (**GHG-5**). Alternative 3 would result in lower GHG emissions compared to the proposed Plan but would not meet the reduction target reference point for 2030, and would result in similar impacts compared to the proposed Plan; refer to Appendix O, Tables O-3 and O-4.

[3] As shown in Table 4.8-6, the majority of the GHG emissions in the San Diego region are from mobile sources.

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	and would result in increased impacts compared to the proposed Plan; refer to Appendix O, Tables O-3 and O-4.		
2035	**Less-than-Significant Impact (increased) –** Alternative 1 would result in less-than-significant impacts in 2035 (**GHG-1**, **GHG-3**, and **GHG-4**). Regional growth, land uses, and transportation network improvements for Alternative 1 would result in higher GHG emissions than the proposed Plan due to a less compact land use pattern and fewer transit-oriented transportation network improvement projects. However, while Alternative 1 emissions are higher than the proposed Plan, Alternative 1 emissions in 2035 would still be below existing levels (**GHG-1**), would achieve at least a 30% reduction per capita relative to existing levels (**GHG-2**), and would not conflict with or impede the implementation of local plans (**GHG-4**). Refer to Appendix O, Tables O-3 and O-4.	**Less-than-Significant Impact (increased) –** Alternative 2 would result in less-than-significant impacts in 2035 (**GHG-1**, **GHG-3**, and **GHG-4**). Regional growth, land uses, and transportation network improvements for Alternative 2 would result in higher GHG emissions than the proposed Plan due to a less compact land use pattern and fewer transit-oriented transportation network improvements. However, while Alternative 2 emissions are higher than the proposed Plan, Alternative 2 emissions in 2035 would still be below existing levels (**GHG-1**), would achieve at least a 30% reduction per capita relative to existing levels (**GHG-2**), and would not conflict with or impede the implementation of local plans (**GHG-4**). Refer to Appendix O, Tables O-3 and O-4.	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in less-than-significant impacts in 2035 (**GHG-1**, **GHG-3,** and **GHG-4**). Regional growth, land uses, and transportation network improvements for Alternative 3 would result in lower GHG emissions than the proposed Plan due to more compact development around mobility hubs and more transit-oriented transportation network improvements and programs, and would result in decreased impacts: refer to Appendix O, Tables O-3 and O-4.
	Significant Impact (increased)- Alternative 1 would result in a significant impact in 2035 for **GHG-2** and would result in an increased impact compared to the proposed Plan. Alternative 1 would result in a ~~-9.06~~-6.80% per capita GHG reduction, which would not meet the 2035 reduction goal 19% below 2005, and would result in less reductions	**Significant Impact (increased)-** Alternative 2 would result in a significant impact in 2035 for **GHG-2** and would result in an increased impact compared to the proposed Plan. Alternative 2 would result in a ~~-13.2~~-12.6% per capita GHG reduction, which would not meet the 2035 reduction goal of 19% below 2005, and would result in less reductions	**Less-than-Significant Impact (decreased)-** Alternative 3 would result in a less-than-significant impact in 2035 for **GHG-2** and would result in a decreased impact compared to the proposed Plan. Alternative 3 would result in a -22.1% per capita GHG reduction, which would exceed the 2035 reduction goal of 19% below

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	than the proposed Plan (~~20.38~~20.40% below 2005); refer to Appendix O, Tables O-3.	than the proposed Plan (~~20.38%~~20.40% below 2005); refer to Appendix O, Tables O-3.	2005, and would result in a greater reduction than the proposed Plan (~~20.38~~20.40% below 2005); refer to Appendix O, Tables O-3.
	Significant Impact (increased) – Alternative 1 would result in a significant impact in 2035 (**GHG-5**). Alternative 1 would result in higher GHG emissions that would not meet the reduction target reference points for 2030 and 2045, and would result in increased impacts compared to the proposed Plan; refer to Appendix O, Tables O-3 and O-4.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2035 (**GHG-5**). Alternative 2 would result in higher GHG emissions that would not meet the reduction target reference points for 2030 and 2045, and would result in increased impacts compared to the proposed Plan; refer to Appendix O, Tables O-3 and O-4.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact in 2035 (**GHG-5**). Alternative 3 would result in lower GHG emissions compared to the proposed Plan but would not meet the reduction target reference points for 2030 and 2045, and would result in similar impacts compared to the proposed Plan; refer to Appendix O, Table O-3 and O-4.
2050	**Less-than-Significant Impact (increased) –** Alternative 1 would result in less-than-significant impacts in 2050 (**GHG-1** and **GHG-4**). Regional growth, land uses, and transportation network improvements for Alternative 1 would result in higher GHG emissions than the proposed Plan and would result in increased impacts; refer to Appendix O, Tables O-3 and O-4.	**Less-than-Significant Impact (increased) –** Alternative 2 would result in less-than-significant impacts in 2050 (**GHG-1** and **GHG-4**). Regional growth, land uses, and transportation network improvements for Alternative 2 would result in higher GHG emissions than the proposed Plan and would result in increased impacts; refer to Appendix O, Tables O-3 and O-4.	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in less-than-significant impacts in 2050 (**GHG-1** and **GHG-4**). Regional growth, land uses, and transportation network improvements for Alternative 3 would result in lower GHG emissions than the proposed Plan due to more compact development, and would result in decreased impacts; refer to Appendix O, Tables O-3 and O-4.
	Significant Impact (increased) – Alternative 1 would result in a significant impact in 2050 (**GHG-5**). Alternative 1 would result in higher GHG emissions that would not meet the reduction target reference points for 2045 and 2050, and would result	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2050 (**GHG-5**). Alternative 2 would result in higher GHG emissions that would not meet the reduction target reference points for 2045 and 2050, and would result	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact in 2050 (**GHG-5**). Alternative 3 would result in lower GHG emissions compared to the proposed Plan. but still would not meet the reduction target

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	in increased impacts compared to the proposed Plan; refer to Appendix O, Tables O-3 and O-4.	in increased impacts compared to the proposed Plan. Refer to Appendix O, Table O-3 and O-4.	reference points for 2045 and 2050. Refer to Appendix O, Table O-3 and O-4.
Hazards and Hazardous Materials			
2025	**Less-than-Significant Impact (same)** – Alternative 1 would result in the following less-than-significant impacts in 2025 for **HAZ-1** create a significant hazard by generating hazardous emissions or handle hazardous materials or result in the release of hazardous materials in the environment during pre-construction, demolition, and/or construction activities, including being located on a Government Code Section 65952.5 hazardous materials site; **HAZ-2** create a significant hazard to the public, schools or the environment through the routine use, handling, transport, or disposal of hazardous materials; **HAZ-3** for a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area; and **HAZ-4** impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan or result in inadequate emergency access. These impacts would be the same as proposed Plan impacts because	**Less-than-Significant Impact (same)** – Alternative 2 would result in less-than-significant impacts in 2025 (**HAZ-1**, **HAZ-2**, **HAZ-3**, and **HAZ-4**). These impacts would be the same as proposed Plan impacts because existing regulations, plans, and programs maintaining these impacts at less-than-significant levels would continue with this alternative.	**Less-than-Significant Impact (same)** – Alternative 3 would result in less-than-significant impacts in 2025 (**HAZ-1**, **HAZ-2**, **HAZ-3**, and **HAZ-4**). These impacts would be the same as proposed Plan impacts because existing regulations, plans, and programs maintaining these impacts at less-than-significant levels would continue with this alternative.

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	existing regulations, plans, and programs maintaining these impacts at less-than-significant levels would continue with this alternative.		
2035	**Less-than-Significant Impact (same)** – Alternative 1 would result in less-than-significant impacts in 2035 (**HAZ-1**, **HAZ-2**, **HAZ-3**, and **HAZ-4**). These impacts would be the same as proposed Plan impacts because existing regulations, plans, and programs maintaining these impacts at less-than-significant levels would continue with this alternative.	**Less-than-Significant Impact (same)** – Alternative 2 would result in less-than-significant impacts in 2035 (**HAZ-1**, **HAZ-2**, **HAZ-3**, and **HAZ-4**). These impacts would be the same as proposed Plan impacts because existing regulations, plans, and programs maintaining these impacts at less-than-significant levels would continue with this alternative.	**Less-than-Significant Impact (same)** – Alternative 3 would result in less-than-significant impacts in 2035 (**HAZ-1**, **HAZ-2**, **HAZ-3**, and **HAZ-4**). These impacts would be the same as proposed Plan impacts because existing regulations, plans, and programs maintaining these impacts at less-than-significant levels would continue with this alternative.
2050	**Less-than-Significant Impact (same)** – Alternative 1 would result in less-than-significant impacts in 2050 (**HAZ-1**, **HAZ-2**, **HAZ-3**, and **HAZ-4**). These impacts would be the same as proposed Plan impacts because existing regulations, plans, and programs maintaining these impacts at less-than-significant levels would continue with this alternative.	**Less-than-Significant Impact (same)** – Alternative 2 would result in less-than-significant impacts in 2050 (**HAZ-1**, **HAZ-2**, **HAZ-3**, and **HAZ-4**). These impacts would be the same as proposed Plan impacts because existing regulations, plans, and programs maintaining these impacts at less-than-significant levels would continue with this alternative.	**Less-than-Significant Impact (same)** – Alternative 3 would result in less-than-significant impacts in 2050 (**HAZ-1**, **HAZ-2**, **HAZ-3**, and **HAZ-4**). These impacts would be the same as proposed Plan impacts because existing regulations, plans, and programs maintaining these impacts at less-than-significant levels would continue with this alternative.
Hydrology and Water Quality			
2025	**Less-than-Significant Impact (increased) –** Alternative 1 would result in the following less-than-significant impacts in 2025 for **HWQ-1** substantially degrade surface water or groundwater quality, including in violation of any water quality standards or waste discharge requirements or in conflict with a	**Less-than-Significant Impact (increased) –** Alternative 2 would result in less-than-significant impacts in 2025 (**HWQ-1**, **HWQ-2**, **HWQ-3**, and **HWQ-4**). Existing regulations, plans, and programs would be in effect, and implementation of design measures would occur, the same as under the proposed Plan;	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in less-than-significant impacts in 2025 (**HWQ-1**, **HWQ-2**, **HWQ-3**, and **HWQ-4**). Existing regulations, plans, and programs would be in effect, and implementation of design measures would occur, the same as under

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	water quality control plan or its implementation; **HWQ-2** substantially alter the existing drainage patter of any area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site; **HWQ-3** substantially alter the existing drainage pattern of an area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would (i) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site or (ii) impede or redirect flood flows; **HWQ-4** substantially increase risk of pollutant release due to inundation of a flood hazard, tsunami, or seiche zone. Existing regulations, plans, and programs would be in effect, and implementation of design measures would occur, the same as under the proposed Plan; however, regional growth would be more dispersed in Alternative 1 compared to the proposed project, which would result in more impervious surfaces and more stormwater run-off region wide. Thus, less-than-significant impacts would be increased.	however, regional growth would be more dispersed in Alternative 2 compared to the proposed project, which would result in more impervious surfaces and more stormwater run-off region wide. Thus less-than-significant impacts would be increased.	the proposed Plan; however, regional growth would be more compact in Alternative 3 compared to the proposed project, which would result in less impervious surfaces and less stormwater run-off region wide. Thus less-than-significant impacts would be decreased.
2035	**Less-than-Significant Impact (increased) –** Alternative 1 would result in less-than-significant impacts in 2035 (**HWQ-1**, **HWQ-2**,	**Less-than-Significant Impact (increased) –** Alternative 2 would result in less-than-significant impacts in 2035 (**HWQ-1**, **HWQ-2**,	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in less-than-significant impacts in 2035 (**HWQ-1**, **HWQ-**

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	HWQ-3, and **HWQ-4**). Existing regulations, plans, and programs would be in effect, and implementation of design measures would occur, the same as under the proposed Plan; however, regional growth would be more dispersed in Alternative 1 compared to the proposed project, which would result in more impervious surfaces and more stormwater run-off region wide. Thus less-than-significant impacts would be increased.	**HWQ-3**, and **HWQ-4**). Existing regulations, plans, and programs would be in effect, and implementation of design measures would occur, the same as under the proposed Plan; however, regional growth would be more dispersed in Alternative 2 compared to the proposed project, which would result in more impervious surfaces and more stormwater run-off region wide. Thus less-than-significant impacts would be increased.	**2**, **HWQ-3**, and **HWQ-4**). Existing regulations, plans, and programs would be in effect, and implementation of design measures would occur, the same as under the proposed Plan; however, regional growth would be more compact in Alternative 3 compared to the proposed project, which would result in less impervious surfaces and less stormwater run-off region wide. Thus less-than-significant impacts would be decreased.
2050	**Less-than-Significant Impact (increased) –** Alternative 1 would result in less-than-significant impacts in 2050 (**HWQ-1**, **HWQ-2**, **HWQ-3**, and **HWQ-4**). Existing regulations, plans, and programs would be in effect, and implementation of design measures would occur, the same as under the proposed Plan; however, regional growth would be more dispersed in Alternative 1 compared to the proposed project, which would result in more impervious surfaces and more stormwater run-off region wide. Thus less-than-significant impacts would be increased.	**Less-than-Significant Impact (increased) –** Alternative 2 would result in less-than-significant impacts in 2050 (**HWQ-1**, **HWQ-2**, **HWQ-3**, and **HWQ-4**). Existing regulations, plans, and programs would be in effect, and implementation of design measures would occur, the same as under the proposed Plan; however, regional growth would be more dispersed in Alternative 2 compared to the proposed project, which would result in more impervious surfaces and more stormwater run-off region wide. Thus less-than-significant impacts would be increased.	**Less-than-Significant Impact (decreased) –** Alternative 3 would result in less-than-significant impacts in 2050 (**HWQ-1**, **HWQ-2**, **HWQ-3**, and **HWQ-4**). Existing regulations, plans, and programs would be in effect, and implementation of design measures would occur, the same as under the proposed Plan; however, regional growth would be more compact in Alternative 3 compared to the proposed project, which would result in less impervious surfaces and less stormwater run-off region wide. Thus less-than-significant impacts would be decreased.
Land Use			
2025	**Significant Impact (decreased)** – Alternative 1 would result in the following significant impact in 2025 for **LU-1** which discusses physically dividing an established	**Significant Impact (increased)** – Alternative 2 would result in the following significant impact in 2025: **LU-1**. Impacts would be increased compared to the	**Significant Impact (same)** – Alternative 3 would result in the following significant impact in 2025 for **LU-1**. Impacts would be the same as the proposed Plan in 2025

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	community. Impacts would be the less than the proposed Plan in 2025 because fewer transportation network improvements would occur that would result in potential to physically divide an established community under Alternative 1.	proposed Plan in 2025 because more transportation network improvements related to highways would occur, which would have an increased potential to physically divide an established community.	because similar transportation network improvements would occur.
	Less-than-Significant Impact (decreased) – Alternative 1 would result in a less-than-significant impact in 2025 for **LU-2**, cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation (including, but not limited to, the General Plan, Local Coastal Program, or Zoning Ordinance) and result in a physical change to the environment not already addressed in the other resource chapters of this EIR. Impacts would be decreased in 2025 compared to the proposed Plan because Alternative 1 land uses would be more consistent with general plans and specific plans.	**Less-than-Significant Impact (decreased)** – Alternative 2 would result in a less-than-significant impact in 2025 for **LU-2**. Impacts would be decreased compared to the proposed Plan in 2025 because the land use patterns in Alternative 2 would have less conflicts with general plans and specific plans than those in the proposed Plan.	**Less-than-Significant Impact (increased) –** Alternative 3 would result in a less-than-significant impact in 2025 for **LU-2**. This impact would be greater as a result of Alternative 3 because more dense development in urban areas would conflict with the land use elements of adopted general plans and specific plans.
2035	**Significant Impact (decreased)** – Alternative 1 would result in a significant impact in 2035 for **LU-1**. Impacts would be decreased compared to the proposed Plan in 2035 because no transportation network improvements would occur after 2025 under Alternative 1.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2035 for **LU-1**. Impacts would be increased compared to the proposed Plan in 2035 because more transportation network improvements related to highways would occur, which would increase the potential to physically divide an established community.	**Significant Impact (same)** – Alternative 3 would result in a significant impact in 2035 for **LU-1**. Impacts would be the same as the proposed Plan in 2035 because similar transportation network improvements would occur.

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	Less-than-Significant Impact (decreased) – Alternative 1 would result in a less-than-significant impact in 2035 for **LU-2**. Impacts would be decreased compared to the proposed Plan in 2035 because the land use patterns would not conflict with adopted general plans and specific plans.	**Less-than-Significant Impact (decreased)** – Alternative 2 would result in the following significant impact in 2035 for **LU-2**. Impacts would be decreased compared to the proposed Plan in 2035 because land use patterns would be consistent with adopted general plans and specific plans.	**Less-than-Significant Impact (increased) –** Alternative 3 would result in a significant impact in 2035 for **LU-2**. This impact would be greater as a result of Alternative 3 because more dense development in urban areas would conflict with the land use portions of adopted general plans and specific plans.
2050	**Significant Impact (decreased)** – Alternative 1 would result in a significant impact in 2050 for **LU-1**. Impacts would be decreased compared to the proposed Plan in 2050 because no transportation network improvements would occur after 2025 under Alternative 1.	**Significant Impact (increased)** – Alternative 2 would result in the following significant impact in 2050 for **LU-1**. Impacts would be increased compared to the proposed Plan in 2050 because more transportation network improvements related to highways would occur, which would increase the potential to physically divide an established community.	**Significant Impact same)** – Alternative 3 would result in the following significant impact in 2050 for **LU-1**. I Impacts would be the same as the proposed Plan in 2050 because similar transportation network improvements would occur.
	Less-than-Significant Impact (decreased) – Alternative 1 would result in a less-than-significant impact in 2050 for **LU-2**. Impacts would be decreased compared to the proposed Plan in 2050 because the land use pattern under Alternative 1 would be consistent with adopted general plans and specific plans.	**Less-than-Significant Impact (decreased)** – Alternative 2 would result in a less-than-significant impact in 2050 for **LU-2**. Impacts would be decreased compared to the proposed Plan in 2050 the land use patterns under Alternative 2 would not conflict with adopted general plans and specific plans.	**Less-than-Significant Impact (increased) –** Alternative 3 would result in a less-than-significant impact in 2050 (**LU-2**). This impact would be greater as a result of Alternative 3 because more dense development in urban areas would conflict with the land use portions of adopted general plans and specific plans.
Mineral Resources			
2025	**Significant Impact (increased)** – Alternative 1 would result in the following significant impact on mineral resources in 2025: **MR-1** result in the loss of availability of	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on mineral resources in 2025 (**MR-1**). The impacts would be increased compared to	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on mineral resources in 2025 (**MR-1**). The impacts would be decreased

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	known aggregate and mineral resources supply sites that would be of value to the region and the residents of the State, or result in the loss of availability of a locally-important mineral resource recovery site delineated in a local general plan, specific plan or other land use plan. The impacts would be increased compared to the proposed Plan in 2025 because Alternative 1 land use would not be as concentrated in urban areas as it would under the proposed Plan and would result in more land use conflict with mineral resources.	the proposed Plan in 2025 because Alternative 2 land use would not be as concentrated in urban areas as it would under the proposed Plan and would result in more land use conflict with mineral resources.	compared to the proposed Plan in 2025 because Alternative 3 land use would be more concentrated in urban areas than it would under the proposed Plan and would result in less land use conflict with mineral resources.
2035	**Significant Impact (increased)** – Alternative 1 would result in a significant impact on mineral resources in 2035 (**MR-1**). The impacts would be increased compared to the proposed Plan in 2035 because Alternative 1 land use would not be as concentrated in urban areas as it would under the proposed Plan and would result in more land use conflict with mineral resources.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on mineral resources in 2035 (**MR-1**). The impacts would be increased compared to the proposed Plan in 2035 because Alternative 2 land use would not be as concentrated in urban areas as it would under the proposed Plan and would result in more land use conflict with mineral resources.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on mineral resources in 2035 (**MR-1**). The impacts would be decreased compared to the proposed Plan in 2035 because Alternative 3 land use would be more concentrated in urban areas than it would under the proposed Plan and would result in less land use conflict with mineral resources.
2050	**Significant Impact (increased)** – Alternative 1 would result in a significant impact on mineral resources in 2050 (**MR-1**). The impacts would be increased compared to the proposed Plan in 2050 because Alternative 1 land use would not be as concentrated in urban areas as it would	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on mineral resources in 2050 (**MR-1**). The impacts would be increased compared to the proposed Plan in 2050 because Alternative 2 land use would not be as concentrated in urban areas as it would	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on mineral resources in 2050 (**MR-1**). The impacts would be decreased compared to the proposed Plan in 2050 because Alternative 3 land use would be more concentrated in urban areas than it

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	under the proposed Plan and would result in more land use conflict with mineral resources.	under the proposed Plan and would result in more land use conflict with mineral resources.	would under the proposed Plan and would result in less land use conflict with mineral resources.
Noise			
2025	**Significant Impact (increased)** – Alternative 1 would result in the following significant impacts in 2025 for **NOI-1** generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies; or generate a substantial absolute increase in ambient noise; and **NOI-2** generation of excessive groundborne vibration or groundborne noise levels. Land use patterns would result in more dispersed development than the proposed Plan, which could expose more sensitive receptors to higher noise levels. Additionally, regional growth and transportation network improvements would occur under this alternative by 2025, resulting in noise and vibration impacts similar to proposed Plan impacts.	**Significant Impact (increased)** – Alternative 2 would result in significant impacts in 2025 (**NOI-1** and **NOI-2**). Land use patterns would result in less compact development compared to the proposed Plan, which could expose more sensitive receptors to high noise levels. Additionally, regional growth and transportation network improvements would occur under this alternative by 2025 resulting in noise and vibration impacts similar to the proposed Plan.	**Significant Impact (decreased)** – Alternative 3 would result in significant impacts in 2025 (**NOI-1** and **NOI-2**). Land use patterns under Alternative 3 would result in more dense development, which could result in exposure of fewer sensitive receptors to high noise levels compared to the proposed Plan. Additionally, regional growth and transportation network improvements would occur under this alternative by 2025 resulting in noise and vibration impacts similar to the proposed Plan.
	Less-than-Significant Impact (same) – Alternative 1 would result in the following less-than-significant impact in 2025 (**NOI-3)** for a project located within the vicinity of a private airstrip or an airport land use plan or,	**Less-than-Significant Impact (same)** – Alternative 1 would result in less-than-significant impacts in 2025 (**NOI-3**). The impact of this alternative is the same as under the proposed Plan because this	**Less-than-Significant Impact (same)** – Alternative 3 would result in less-than-significant impacts in 2025 (**NOI-3**). The impact of this alternative is the same as under the proposed Plan because this

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would expose people residing or working in the project area to excessive noise levels. The impact of this alternative is the same as under the proposed Plan because this alternative would not meaningfully change exposure of people to excessive noise levels from aircraft.	alternative would not meaningfully change exposure of people to excessive noise levels from aircraft.	alternative would not meaningfully change exposure of people to excessive noise levels from aircraft.
2035	**Significant Impact (same)** – Alternative 1 would result in significant impacts in 2035 (**NOI-1** and **NOI-2**). Land use patterns would be less compact under Alternative 1, which could expose more sensitive receptors to high noise levels. In addition, no transportation network improvements would occur under this alternative after 2035, resulting in less noise and vibration impacts than to the proposed Plan. The net change would result in noise impacts similar to the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in significant impacts in 2035 (**NOI-1** and **NOI-2**). Land use patterns would be less compact than the proposed Plan, which could expose more sensitive receptors to high noise levels. Additionally, regional growth and transportation network improvements would occur under this alternative by 2035 resulting in noise and vibration impacts similar to the proposed Plan.	**Significant Impact (decreased)** – Alternative 3 would result in significant impacts in 2035 (**NOI-1** and **NOI-2**). Land use patterns would be more compact than the proposed Plan, which could result in the exposure of fewer sensitive receptors to high noise levels than the proposed Plan. In addition, regional growth and transportation network improvements would occur under this alternative by 2035 resulting in noise and vibration impacts similar to the proposed Plan.
	Less-than-Significant Impact (same) – Alternative 1 would result in less-than-significant impacts in 2035 (**NOI-3**). The impact of this alternative is the same as under the proposed Plan because this alternative would not meaningfully change exposure of people to excessive noise levels from aircraft.	**Less-than-Significant Impact (same)** – Alternative 2 would result in less-than-significant impacts in 2035 (**NOI-3**). The impact of this alternative is the same as under the proposed Plan because this alternative would not meaningfully change exposure of people to excessive noise levels from aircraft.	**Less-than-Significant Impact (same)** – Alternative 3 would result in less-than-significant impacts in 2035 (**NOI-3**). The impact of this alternative is the same as under the proposed Plan because this alternative would not meaningfully change exposure of people to excessive noise levels from aircraft.

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
2050	**Significant Impact (same)** – Alternative 1 would result in significant impacts in 2050 (**NOI-1** and **NOI-2**). Land use patterns would be less compact under Alternative 1, which could expose more sensitive receptors to high noise levels. In addition, no transportation network improvements would occur under this alternative after 2035, resulting in less noise and vibration impacts than to the proposed Plan. The net change would result in noise impacts similar to the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in significant impacts in 2050 (**NOI-1** and **NOI-2**). Land use patterns would be less compact under Alternative 2, which could expose more sensitive receptors to high noise levels. Additionally, regional growth and transportation network improvements would occur under this alternative by 2050 resulting in noise and vibration impacts similar to the proposed Plan.	**Significant Impact (decreased)** – Alternative 3 would result in significant impacts in 2050 (**NOI-1** and **NOI-2**). Land use patterns would be more compact under Alternative 3, which could result in the exposure of fewer sensitive receptors to high noise levels. Additionally, regional growth and transportation network improvements would occur under this alternative by 2050 resulting in noise and vibration impacts similar to the proposed Plan.
	Less-than-Significant Impact (same) – Alternative 1 would result in less-than-significant impacts in 2050 (**NOI-3**). The impact of this alternative is the same as under the proposed Plan because this alternative would not meaningfully change exposure of people to excessive noise levels from aircraft.	**Less-than-Significant Impact (same)** – Alternative 1 would result in less-than-significant impacts in 2050 (**NOI-3**). The impact of this alternative is the same as under the proposed Plan because this alternative would not meaningfully change exposure of people to excessive noise levels from aircraft.	**Less-than-Significant Impact (same)** – Alternative 3 would result in less-than-significant impacts in 2035 (**NOI-3**). The impact of this alternative is the same as under the proposed Plan because this alternative would not meaningfully change exposure of people to excessive noise levels from aircraft.
Population and Housing			
2025	**Significant Impact (decreased)** – Alternative 1 would result in the following significant impacts in 2025 for **POP-1** induce substantial unplanned population growth in the region, either directly (for example, by proposing new homes or businesses) or indirectly (for example, through extension of roads or other infrastructure). The impact of	**Significant Impact (decreased)** – Alternative 2 would result in significant impacts in 2025 for **POP-1**. The impact of this alternative would be less than the proposed Plan impacts because fewer transportation improvement projects and a less compact land use pattern would result in less induced unplanned growth than the proposed Plan.	**Significant Impact (increased) –** Alternative 3 would result in significant impacts in 2025 for **POP-1**. The impact of this alternative would be greater than the proposed Plan impacts because growth would occur in dense developed areas, and more transportation improvement projects would occur within developed areas,

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	this alternative would be less than the proposed Plan impact because fewer transportation improvement projects and less compact development consistent with the General Plans would result in less induced unplanned growth than the proposed Plan in 2025. implementation of the proposed Plan.		resulting in greater induced unplanned growth.
	Significant Impact (decreased) – Alternative 1 would result in the following significant impact for 2025 for **POP-2** which discusses displacing substantial numbers of people or housing units which would necessitate the construction of replacement homes elsewhere. Alternative 1 would result in less impacts than the proposed Plan because less compact land use patterns and fewer transportation projects would result in less displacement of people and housing units than the proposed Plan.	**Significant Impact (decreased)** – Alternative 2 would result in a significant impact for 2025 for **POP-2**. Alternative 2 would result in less impacts than the proposed Plan because less compact land use patterns and fewer transportation projects in developed areas would result in less displacement of people and housing units than the proposed Plan.	**Significant Impact (increased)** – Alternative 3 would result in a significant impact for 2025 for **POP-2**. Alternative 3 would result in greater impacts than the proposed Plan because more compact land use patterns and more transportation projects in developed areas would result in greater displacement of people and housing units. In addition, the growth that could occur under this alternative would be even further beyond what is anticipated in local general plans compared to the unplanned population growth that could occur under the proposed Plan.
2035	**Significant Impact (decreased) –** Impact **POP-1** would be significant in 2035, and the same as the proposed Plan impact. Under this alternative, less compact land use patterns and no proposed transportation improvements would result in less impacts related to induced unplanned growth when compared to the proposed Plan.	**Significant Impact (decreased)** – Impact **POP-1** would be significant in 2035, and greater than the proposed Plan impact. Under this alternative, less compact development and fewer transportation improvements would result in a decreased impact related to induced unplanned growth when compared to the proposed Plan.	**Significant Impact (increased) –** Impacts **POP-1** would be significant in 2035, and greater than proposed Plan impacts. Increased densification around mobility hubs would result in a greater potential for unplanned population growth in transit served areas than with the proposed Plan.

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	Significant Impact (decreased) – Impact **POP-2** would be significant in 2035, and less than proposed Plan impact. Under this alternative, displacement impact would be less than proposed Plan impact because more vacant land would be developed and less existing urban land redeveloped, and because the proposed Plan's transportation network improvements would not be built.	**Significant Impact (decreased**) – Impact **POP-2** would be significant in 2035, and less than proposed Plan impact. Under this alternative, displacement impact would be less than proposed Plan impact because more vacant land would be developed and less existing urban land redeveloped, and because fewer transportation projects in developed areas would result in less displacement of people and housing units than the proposed Plan.	**Significant Impact (increased)** – Alternative 3 would result in a significant impact for 2035 for **POP-2**. Increased compact land use patterns and more transportation projects in developed areas would result in greater displacement of people and housing units. In addition, the growth that could occur under this alternative would be even further beyond what is anticipated in local general plans compared to the unplanned population growth that could occur under the proposed Plan.
2050	**Significant Impact (decreased) –** Impact **POP-1** would be significant in 2050, and the same as the proposed Plan impact. Under this alternative, less compact land use patterns and no proposed transportation improvements would result in less impacts related to induced unplanned growth when compared to the proposed Plan.	**Significant Impact (decreased)** – Impact **POP-1** would be significant in 2035, and the same as proposed Plan impact. Under this alternative, less compact land use patterns and no proposed transportation improvements would result in less impacts related to induced unplanned growth when compared to the proposed Plan.	**Significant Impact (increased) –** Impacts **POP-1** would be significant in 2050, and greater than proposed Plan impacts. Increased densification around mobility hubs would result in a greater potential for unplanned population growth in transit served areas than with the proposed Plan.
	Significant Impact (decreased) – Impact **POP-2** would be significant in 2035, and less than proposed Plan impact. Under this alternative, displacement impact would be less than proposed Plan impact because more vacant land would be developed and less existing urban land redeveloped, and because the proposed Plan's transportation network improvements would not be built.	**Significant Impact (decreased) –** Impact **POP-2** would be significant in 2035, and less than proposed Plan impact. Under this alternative, displacement impact would be less than proposed Plan impact because more vacant land would be developed and less existing urban land redeveloped, and because fewer transportation projects in developed areas would result in less displacement of	**Significant Impact (increased)** – Alternative 3 would result in a significant impact for 2050 for **POP-2**. Increased compact land use patterns and more transportation projects in developed areas would result in greater displacement of people and housing units. In addition, the growth that could occur under this alternative would be even further beyond

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		people and housing units than the proposed Plan.	what is anticipated in local general plans compared to the unplanned population growth that could occur under the proposed Plan.
Public Services and Utilities			
2025	**Significant Impact (decreased)** – Alternative 1 would result in the following significant impacts in 2025 for **PS-1** result in substantial physical deterioration of public facilities or cause substantial adverse physical impacts associated with the provision of or need for new or physically altered (i.e. expanded) public facilities, in order to maintain adequate fire and police protection, emergency services, schools, libraries, and recreation facilities; **REC-1** increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; **U-1** result in the expansion or construction of wastewater collection and treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities to adequately meet projected capacity needs, the construction of which could cause significant environmental impacts; **U-2** generate solid waste in excess of State or local standards or in excess of the capacity of local infrastructure; negatively	**Significant Impact (same)** – Alternative 2 would result in the following significant impacts in 2025 for **PS-1**, **REC-1**, **U-1**, and **U-2**. Under this alternative, land use patterns would be more dispersed than the proposed Plan, which would spread out the population and increase demand for public services, recreational facilities and utilities, and therefore the impact would be increased.	**Significant Impact (same)** – Alternative 3 would result in the following significant impacts in 2025 for **PS-1**, **REC-1**, **U-1**, and **U-2**. Under this alternative, land use patterns would be more compact which would concentrate the population, resulting in a decrease in demand for public services, recreational facilities and utilities, and therefore the impact would be decreased.

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	impact the provision of solid waste services or impair the attainment of solid waste reduction goals; or fail to comply with federal, State, and local management and reduction statutes and regulations related to solid waste. Under Alternative 1, land use patterns would be more dispersed than the proposed Plan, which would spread out the population and increase demand for public services, recreational facilities and utilities in different areas, and therefore the impact would be increased.		
2035	**Significant Impact (increased)** – Alternative 1 would result in the following significant impacts in 2035 for **PS-1**, **REC-1**, **U-1**, and **U-2**. Under this alternative, land use patterns would be less compact, which would result in a greater demand for public services, recreational facilities and utilities, and therefore the impact would be increased.	**Significant Impact (increased)** – Alternative 2 would result in the following significant impacts in 2035 for **PS-1**, **REC-1**, **U-1**, and **U-2**. Under this alternative, land use patterns would be less compact, which would result in a greater demand for public services, recreational facilities and utilities, and therefore the impact would be increased.	**Significant Impact (decreased)** – Alternative 3 would result in the following significant impacts in 2035 for **PS-1**, **REC-1**, **U-1**, and **U-2**. Under this alternative, land use patterns would be more compact, which would result in less demand for public services, recreational facilities and utilities, and therefore the impact would be decreased.
2050	**Significant Impact (increased)** – Alternative 1 would result in the following significant impacts in 2050 for **PS-1**, **REC-1**, **U-1**, and **U-2**. Under this alternative, land use patterns would be less compact, which would result in a greater demand for public services, recreational facilities and utilities, and therefore the impact would be increased.	**Significant Impact (increased)** – Alternative 1 would result in the following significant impacts in 2050 for **PS-1**, **REC-1**, **U-1**, and **U-2**. Under this alternative, land use patterns would be less compact, which would result in a greater demand for public services, recreational facilities and utilities, and therefore the impact would be increased.	**Significant Impact (decreased)** – Alternative 3 would result in the following significant impacts in 2050 for **PS-1**, **REC-1**, **U-1**, and **U-2**. Under this alternative, land use patterns would be more compact, which would result in less demand for public services, recreational facilities and utilities, and therefore the impact would be decreased.

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Transportation			
2025	**Less-than-Significant Impact (same)** – Alternative 1 would result in less-than-significant impacts in 2025 for **TRA-1.** Alternative 1 would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities; and **TRA-3** Alternative 1 would not substantially increase hazards due to a design feature. The impact of this alternative is the same as proposed Plan impact because this alternative would be consistent with adopted plans, programs, and design standards.	**Less-than-Significant Impact (same)** – Alternative 2 would result in less-than-significant impacts in 2025 for **TRA-1** and **TRA-3**. The impact of this alternative is the same as proposed Plan impact because this alternative would be consistent with adopted plans, programs, and design standards.	**Less-than-Significant Impact (same)** – Alternative 3 would result in less-than-significant impacts in 2025 for **TRA-1** and **TRA-3**. The impact of this alternative is the same as proposed Plan impact because this alternative would be consistent with adopted plans, programs, and design standards.
	Significant Impact (increased) – Alternative 1 would result in significant impacts in 2025 for **TRA-2.** Alternative 1 would conflict or be inconsistent with CEQA Guidelines Section 15064.3 by not achieving the substantial VMT reductions needed to help achieve statewide GHG reduction goals. Alternative 1 would result in VMT per capita of ~~19.3~~ 18.73 in 2025 (~~for all vehicle classes~~home-based), which would be greater than the VMT per capita for the proposed Plan of ~~18.1~~17.66 (see Appendix O, Table O-2). Additionally, Alternative 1 would result in an increase in total VMT of ~~4,545,715~~ 4,653,626 miles per day in year 2025, as	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2025 (**TRA-2**). Alternative 2 would result in VMT per capita of 18.8 (~~for all vehicle classes~~home-based) in 2025, which would be greater than the VMT per capita for the proposed Plan of ~~18.1~~18.3 (see Appendix O, Table O-2). Additionally, Alternative 2 would result in an increase in total VMT of ~~2,961,708~~ 3,095,941 miles per day in year 2025, as compared to Baseline Year 2016 conditions. This increase would be greater than the ~~477,196~~923,702 miles for the proposed Plan. Alternative 2 would result in	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact in 2025 (**TRA-2**). Alternative 3 would result in a slightly decreased VMT per capita of ~~18.0~~17.4 (~~for all vehicle classes~~home-based) compared to the proposed Plan VMT per capita of ~~18.1~~18.3. (see Appendix O, Table O-2). Alternative 3 would result in an overall decrease in total VMT of ~~237,605~~101,253 miles per day in year 2025, as compared to Baseline Year 2016 conditions. This reduction in total VMT is lower than the projected increase in the total VMT of ~~477,196~~923,702 miles under the proposed Plan. Alternative 3

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	compared to Baseline Year 2016 conditions. The increase would be greater than the ~~477,196~~923,702 miles for the proposed Plan. Alternative 1 would result in a greater impact because it would result in less VMT reduction than the proposed Plan.	a greater impact because it would not achieve as much VMT reduction as the proposed Plan.	would result in less impacts because it would achieve a higher VMT reduction than the proposed Plan.
	Less-than-Significant Impact (decreased) – Alternative 1 would result in less-than-significant impacts in 2025 for **TRA-4** leading to a lack of parking supply that would cause significant secondary environmental impacts not already analyzed in the other resource chapters of this EIR. Alternative 1 would result in less impacts because it would not propose as many transit-oriented transportation network improvements and programs, and would not include parking user fees to disincentivize parking that would be included in the proposed Plan; thus, Alternative 1 would result in decreased impacts.	**Less-than-Significant Impact (decreased)** – Alternative 2 would result in a less-than-significant impact in 2025 (**TRA-4**). Alternative 2 would result in less impacts because it would not propose as many transit-oriented transportation network improvements and programs that could affect parking supply.	**Less-than-Significant Impact (increased)** – Alternative 3 would result in a less-than-significant impact in 2025 (**TRA-4**). Alternative 3 would result in more impacts related to parking supply because it would increase the density of land uses in urban areas and include increased parking fees which could adversely affect parking supply.
2035	**Less-than-Significant Impact (same)** – Alternative 1 would result in less-than-significant impacts in 2035 for **TRA-1** and **TRA-3**. The impact of this alternative is the same as proposed Plan impact because this alternative would be consistent with adopted plans, programs, and design standards.	**Less-than-Significant Impact (same)** – Alternative 2 would result in less-than-significant impacts in 2035 for **TRA-1** and **TRA-3**. The impact of this alternative is the same as proposed Plan impact because this alternative would be consistent with adopted plans, programs, and design standards.	**Less-than-Significant Impact (same)** – Alternative 3 would result in less-than-significant impacts in 2035 for **TRA-1** and **TRA-3**. The impact of this alternative is the same as proposed Plan impact because this alternative would be consistent with adopted plans, programs, and design standards.

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	Significant Impact (increased) – Alternative 1 would result in a significant impact in 2035 (**TRA-2**). Alternative 1 would result in VMT per capital of ~~19.4~~18.8 (~~for all vehicle classes~~home-based) in 2035 compared to the proposed Plan's VMT per capita of ~~17.3~~16.58 in 2035 (see Appendix O, Table O-2). Additionally, Alternative 1 would result in an increase in total VMT of ~~11,029,722~~10,760,087 miles per day in year 2035, as compared to Baseline Year 2016 conditions. This increase would be greater than the ~~2,520,860~~1,798,264 miles for the proposed Plan. Alternative 1 would result in greater impacts because it would not achieve as much VMT reduction as the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2035 (**TRA-2**). Alternative 2 would result in VMT per capita of ~~18.8~~18.2 (~~for all vehicle classes~~home-based) compared to the proposed Plan VMT per capita of ~~17.3~~16.58 (see Appendix O, Table O-2). Additionally, Alternative 2 would result in an increase in total VMT of ~~8,645,857~~8,509,341 miles per day in year 2035, as compared to Baseline Year 2016 conditions. This increase would be greater than the ~~2,520,860~~ 1,798,264 miles for the proposed Plan. Alternative 2 would result in greater impacts because it would not achieve as much VMT reduction as the proposed Plan.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact in 2035 (**TRA-2**). Alternative 3 would result in VMT per capita in 2035 of ~~16.9~~16.2 (~~for all vehicle classes~~home-based) compared to the proposed Plan's VMT per capita of ~~17.3~~16.58 (see Appendix O, Table O-2). Alternative 3 would result in an increase in total VMT of ~~986,460~~341,123 miles per day in year 2035, as compared to Baseline Year 2016 conditions. This increase in total VMT is lower than the projected increase in the total VMT of ~~2,520,860~~1,798,264 miles under the proposed Plan. Alternative 3 would result in less impacts because it would achieve a higher VMT reduction than the proposed Plan.
	Less-than-Significant Impact (decreased) – Alternative 1 would result in a less-than-significant impact in 2035 (**TRA-4**). Alternative 1 would result in less impacts because it would not propose as many transit-oriented transportation network improvements programs and would not include parking user fees to disincentivize parking that would be included in the proposed Plan; thus, Alternative 1 would result in decreased impacts.	**Less-than-Significant Impact (decreased)** – Alternative 2 would result in a less-than-significant impact in 2035 (**TRA-4**). Alternative 2 would result in less impacts because it would not propose as many transit-oriented transportation network improvements and programs that could affect parking supply.	**Less-than-Significant Impact (increased)** – Alternative 3 would result in a less-than-significant impact in 2035 (**TRA-4**). Alternative 3 would result in more impacts related to parking supply because it would increase the density of land uses in urban areas and increase parking user fees, which could adversely affect parking supply.

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2050	**Less-than-Significant Impact (same)** – Alternative 1 would result in less-than-significant impacts in 2050 for **TRA-1** and **TRA-3**. The impact of this alternative is the same as proposed Plan impact because this alternative would be consistent with adopted plans, programs, and design standards.	**Less-than-Significant Impact (same)** – Alternative 2 would result in less-than-significant impacts in 2050 for **TRA-1** and **TRA-3**. The impact of this alternative is the same as proposed Plan impact because this alternative would be consistent with adopted plans, programs, and design standards.	**Less-than-Significant Impact (same)** – Alternative 3 would result in less-than-significant impacts in 2050 for TRA-1 and TRA-3. The impact of this alternative is the same as proposed Plan impact because this alternative would be consistent with adopted plans, programs, and design standards.
	Significant Impact (increased) – Alternative 1 would result in a significant impact in 2050 (**TRA-2**). Alternative 1 would result in VMT per capita of ~~19.6~~18.90 (~~for all vehicle classes~~home-based) compared to the proposed Plan VMT per capita of ~~16.8~~16.03 in 2050 (see Appendix O, Table O-2). Additionally, Alternative 1 would result in an increase in total VMT of ~~16,362,799~~16,456,459 miles per day in year 2050, as compared to Baseline Year 2016 conditions. This increase would be greater than the ~~5,611,752~~4,519,230 miles for the proposed Plan. Alternative 1 would result in greater impacts because it would not achieve as much VMT reduction as the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact in 2050 (**TRA-2**). Alternative 2 would result in VMT per capita of ~~18.6~~18.1 (~~for all vehicle classes~~home-based) compared to the proposed Plan VMT per capita of ~~16.8~~16.03 in 2050 (see Appendix O, Table O-2). Additionally, Alternative 1 would result in an increase in total VMT of ~~13,395,418~~13,553,749 miles per day in year 2050, as compared to Baseline Year 2016 conditions. This increase would be greater than the ~~5,611,752~~4,519,230 miles for the proposed Plan. Alternative 2 would result in greater impacts because it would not achieve as much VMT reduction as the proposed Plan.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact in 2050 (**TRA-2**). Alternative 3 would result in VMT per capita of ~~16.3~~15.6 (~~for all vehicle classes~~home-based) compared to the proposed Plan VMT per capita of ~~16.8~~16.03 in 2050. (see Appendix O, Table O-2). Alternative 3 would result in an increase in total VMT of ~~3,479,273~~2,756,715 miles per day in year 2050, as compared to Baseline Year 2016 conditions. This increase in total VMT is lower than the projected increase in the total VMT of ~~5,611,752~~4,519,230 miles under the proposed Plan. Alternative 3 would result in less impacts because it would achieve a higher VMT reduction than the proposed Plan.
	Less-than-Significant Impact (decreased) – Alternative 1 would result in a less-than-significant impact in 2050 (**TRA-4**). Alternative 1 would result in less impacts	**Less-than-Significant Impact (decreased)** – Alternative 2 would result in a less-than-significant impact in 2050 (**TRA-4**). Alternative 2 would result in less impacts	**Less-than-Significant Impact (increased)** – Alternative 3 would result in a less-than-significant impact in 2050 (**TRA-4**). Alternative 3 would result in more impacts

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	because it would not propose as many transit-oriented transportation network improvements and programs that could affect parking supply.	because it would not propose as many transit-oriented transportation network improvements and programs that could affect parking supply.	related to parking supply because it would increase the density of land uses in urban areas and increase parking user fees, which could adversely affect parking supply.
Tribal Cultural Resources			
2025	**Significant Impact (same)** – Alternative 1 would result in a significant impact on tribal cultural resources in 2025 from the potential to cause a substantial adverse change in the significance of an adverse change in the significance of a tribal cultural resource (**TCR-1**). The impacts of Alternative 1 in 2025 would be similar to the proposed Plan due to similar ground-disturbing activities that could encounter and adversely affect tribal cultural resources. Growth associated with Alternative 1 would be more spread-out in the region potentially resulting in more impacts to previously undisturbed land. However, there would be less disturbance due to transportation improvements; thus, the impact would be similar to the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on tribal cultural resources in 2025 (**TCR-1**). The impacts of Alternative 2 in 2025 would be increased compared to the proposed Plan due to similar ground-disturbing activities related to less compact growth and transportation improvements focused on highways and roadways more than mobility hubs that could encounter and adversely affect tribal cultural resources.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on cultural resources in 2025 (**TCR-1**). The impacts of Alternative 3 in 2025 would be decreased compared to the proposed Plan because more compact development and less roadway and highway-related transportation improvements would occur, which would result in less ground-disturbing activities that could encounter and adversely affect tribal cultural resources.
2035	**Significant Impact (decreased)** – Alternative 1 would result in a significant impact on tribal cultural resources in 2035 (**TCR-1**). The impacts of Alternative 1 in 2035 would be less than the proposed Plan because growth associated with Alternative 1 would be more spread-out in the region	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on tribal cultural resources in 2035 (**TCR-1**). The impacts of Alternative 2 in 2035 would greater than the proposed Plan due to similar ground-disturbing activities related to less compact growth and	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on tribal cultural resources in 2035 (**TCR-1**). The impacts of Alternative 3 in 2035 would be decreased compared to the proposed Plan because more compact development and less roadway and

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	potentially resulting in more impacts to previously undisturbed land. However, there would be significantly less disturbance due to transportation improvements because there would be no new improvements beyond 2025; thus, the impact would be less than the proposed Plan.	transportation improvements focused on highways rather than mobility hubs that could encounter and adversely affect tribal cultural resources.	highway-related transportation improvements would occur, which would result in less ground-disturbing activities that could encounter and adversely affect tribal cultural resources.
2050	**Significant Impact (decreased** – Alternative 1 would result in a significant impact on tribal cultural resources in 2050 (**TCR-1**). The impacts of Alternative 1 in 2050 would be less than the proposed Plan because growth associated with Alternative 1 would be more spread-out in the region potentially resulting in more impacts to previously undisturbed land. However, there would be significantly less disturbance due to transportation improvements because there would be no new improvements beyond 2025; thus, the impact would be less than the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in a significant impact on tribal cultural resources in 2050 (**TCR-1).** The impacts of Alternative 2 in 2050 would be increased compared to the proposed Plan due to similar ground-disturbing activities related to less compact growth and transportation improvements focused on highways rather than mobility hubs that could encounter and adversely affect tribal cultural resources.	**Significant Impact (decreased)** – Alternative 3 would result in a significant impact on tribal cultural resources in 2050 (**TCR-1**). The impacts of Alternative 3 in 2050 would be decreased compared to the proposed Plan because more compact development and less roadway and highway-related transportation improvements would occur, which would result in less ground-disturbing activities that could encounter and adversely affect tribal cultural resources.
Water Supply			
2025	**Less-than-Significant Impact (increased)** – Alternative 1 would result in a less-than-significant impact in 2025 related to having insufficient water supplies available to serve the projected regional demand during normal, dry and multiple dry years (**WS-1**). Alternative 1 would have a less compact development pattern than the proposed Plan	**Less-than-Significant Impact (increased)** – Alternative 1 would result in a less-than-significant impact in 2025 (**WS-1**). Alternative 2 would have a less compact development pattern than the proposed Plan, which would result in increased water supply demand. Thus, Alternative 2 would have increased impact compared to the proposed	**Less-than-Significant Impact (decreased)** – Alternative 3 would result in a less-than-significant impact in 2025 (**WS-1**). Alternative 3 would have a more compact development pattern than the proposed Plan, which would result in decreased water supply demand. Thus, Alternative 3 would

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	which would result in higher demand for water supply. Thus, Alternative 1 would have an increased impact compared to the proposed Plan.	Plan. regional water demand impacts would be similar to the proposed Plan because sufficient water supplies exist in 2025 per SDCWA and MWD planning documents.	have a decreased impact compared to the proposed Plan.
	Significant Impact (increased) – Alternative 1 would result in the following significant impacts in 2025 for **WS-2** substantially reduce groundwater supplies, groundwater recharge, or the sustainable management of groundwater basins; and **WS-3** require or result in the construction of new or expanded water facilities, the construction of which could cause a significant environmental effect. Compared to the proposed Plan, regional groundwater impacts would be greater due to a less compact development pattern, as well as the additional water distribution facilities that would be needed to serve more dispersed development.	**Significant Impact (increased)** – Alternative 2 would result in significant impacts in 2025 for **WS-2** and **WS-3**. Compared to the proposed Plan, regional groundwater impacts would be greater due to a less compact development pattern, as well as the additional water distribution facilities that would be needed to serve more dispersed development.	**Significant Impact (decreased)** – Alternative 3 would result in significant impacts in 2025 for **WS-2** and WS-3. Compared to proposed Plan, regional groundwater impacts would be less decrease due to a more compact development pattern, and fewer water distribution facilities that would be needed to serve more dispersed development. Regional groundwater impacts would also be less than the proposed Plan because this alternative would result in more compact development and less demand for landscape watering, thereby reducing the need for additional water distribution facilities.
2035	**Less-than-Significant Impact (increased)** – Impact **WS-1** would be less than significant in 2035 under Alternative 1, and increased compared to the proposed Plan impact. The rationale described under 2025 also applies to 2035.	**Less-than-Significant Impact (increased)** – Impact **WS-1** would be less than significant in 2035 under Alternative 2, and increased compared to the proposed Plan impact. The rationale described under 2025 also applies to 2035.	**Less-than-Significant Impact (decreased)** – Impact **WS-1** would be less than significant in 2035 under Alternative 3, and decreased compared to the proposed Plan impact. The rationale described under 2025 also applies to 2035.
	Significant Impact (increased) – Impact **WS-2** and **WS-3** would be significant in 2035 under this alternative, and greater than the	**Significant Impact (increased) –** Impact **WS-2** and **WS-3** would be significant in 2035 under this alternative, and greater than the	**Significant Impact (decreased) –** Impact **WS-2** and **WS-3** would be significant in 2035 under this alternative, and less than

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	proposed Plan impact. The rationale described under 2025 also applies to 2035.	proposed Plan impact. The rationale described under 2025 also applies to 2035.	the proposed Plan impact. The rationale described under 2025 also applies to 2035.
2050	**Significant Impact (increased) –** Alternative 1 would result in a significant impact in 2050 (**WS-1**). Regional water demand impacts for this alternative would be greater than the proposed Plan impact due higher water demand associated with a less compact development pattern.	**Significant Impact (increased) –** Alternative 2 would result in a significant impact in 2050 (**WS-1**). Regional water demand impacts for this alternative would be greater than the proposed Plan impact due to higher water demand associated with a less compact development pattern.	**Significant Impact (decreased) –** Alternative 3 would result in a significant impact in 2050 (**WS-1**). However, regional water demand impacts under this alternative would be less than the proposed Plan because it would result in lower water demand associated with more compact development and less demand for landscape watering, reducing the regional growth/land use change impact of the proposed Plan.
	Significant Impact (increased) – Impact **WS-2** and **WS-3** would be significant in 2050 under this alternative, and greater than the proposed Plan impact. The rationale described under 2025 also applies to 2050.	**Significant Impact (increased) –** Impact **WS-2** and **WS-3** would be significant in 2050 under this alternative, and greater than the proposed Plan impact. The rationale described under 2025 also applies to 2050.	**Significant Impact (decreased) –** Impact **WS-2** and **WS-3** would be significant in 2035 under this alternative, and less than the proposed Plan impact. The rationale described under 2025 also applies to 2050.
Wildfire			
2025	**Significant Impact (same)** – Alternative 1 would result in the following significant impacts in 2025: **WF-1** due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire; or expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires; **WF-2** require the installation	**Significant Impact (increased)** – Alternative 2 would result in significant impacts in 2025 (**WF-1**, **WF-2**, and **WF-3**). Alternative 2 would result in greater impacts because it would result in more regional growth, land use change, and transportation network improvements in the wildland-urban interface than the proposed Plan.	**Significant Impact (same)** – Alternative 3 would result in significant impacts in 2025 (**WF-1**, **WF-2**, and **WF-3**). Alternative 3 would result in the same impacts as the proposed Plan because it would result in similar regional growth and land use change in dense urban areas and less in wildland-urban interface up to 2025 compared to the proposed Plan.

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment; and WF-3 expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. Alternative 1 would result in similar impacts as the proposed Plan because it would result in similar regional growth, land use change, and transportation network improvements in wildland-urban interface as the proposed Plan up to 2025.		
2035	**Significant Impact (increased)** – Alternative 1 would result in significant impacts in 2035 (**WF-1**, **WF-2**, and **WF-3**). Alternative 1 would result in greater impacts because it would result in more regional growth, land use change, and transportation network improvements in wildland-urban interface than the proposed Plan.	**Significant Impact (increased)** – Alternative 2 would result in significant impacts in 2035 (**WF-1**, **WF-2**, and **WF-3**). Alternative 2 would result in greater impacts because it would result in more regional growth, land use change, and transportation network improvements in wildland-urban interface than the proposed Plan.	**Significant Impact (decreased)** – Alternative 3 would result in significant impacts in 2035 (**WF-1**, **WF-2**, and **WF-3**). Alternative 3 would result in less impacts because it would result in more regional growth and land use change in dense urban areas and less in wildland-urban interface compared to the proposed Plan.
2050	**Significant Impact (increased)** – Alternative 1 would result in significant impacts in 2050 (**WF-1**, **WF-2**, and **WF-3**). Alternative 1 would result in greater impacts because it would result in more regional growth, land use change, and transportation	**Significant Impact (increased)** – Alternative 2 would result in significant impacts in 2050 (**WF-1**, **WF-2**, and **WF-3**). Alternative 2 would result in greater impacts because it would result in more regional growth, land use change, and transportation	**Significant Impact (decreased)** – Alternative 3 would result in significant impacts in 2050 (**WF-1**, **WF-2**, and **WF-3**). Alternative 3 would result in less impacts because it would result in more regional growth and land use change in dense urban

Year	Alternative 1: No Project	Alternative 2: 2019 Transportation Network with New Value Pricing and User Fee Policies	Alternative 3: All Growth Focused in Mobility Hubs and More Progressive Value Pricing and User Fee Policies
	network improvements in wildland-urban interface than the proposed Plan.	network improvements in wildland-urban interface than the proposed Plan.	areas and less in wildland-urban interface compared to the proposed Plan.

7 OTHER CONSIDERATIONS REQUIRED BY CEQA

This chapter addresses the following other considerations required by CEQA based on the impact analysis in Chapter 4 and the alternatives analysis in Chapter 6: growth inducement, maximum theoretical buildout, significant irreversible impacts, and significant and unavoidable impacts.

7.1 GROWTH INDUCEMENT

7.1.1 BACKGROUND

A project is defined as growth inducing when it: directly or indirectly fosters economic growth, population growth, or additional housing; removes obstacles to growth; or encourages or facilitates other activities that would significantly affect the environment (CEQA Guidelines Section 15126.2). Growth inducement would be caused by the provision or extension of utilities and public services. For example, the development of water, wastewater, fire, or other services in previously underserved areas; the extension of transportation routes into undeveloped areas; and the establishment of major new employment opportunities would all induce growth. The proposed Plan is considered growth-inducing for the reasons presented below. In addition, Section 4.14, *Population and Housing,* under Impact POP-1, analyzes whether implementation of the proposed Plan would induce substantial unplanned population growth to areas of the region either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., by extending roads and other infrastructure).

7.1.2 ECONOMIC GROWTH, POPULATION GROWTH, ADDITIONAL HOUSING

From 2016 to 2050, the regional population is forecasted to increase by over 436,000 people (13 percent), adding over 280,000 housing units and over 439,000 jobs. The proposed Plan's objectives include focusing population and employment growth in existing urbanized areas to protect sensitive habitat and natural resource areas, and providing transportation investments that support compact land development patterns.

The proposed Plan focuses this population, housing unit, and employment growth in either Mobility Hubs or Smart Growth Opportunity Areas near existing and planned transportation infrastructure and in areas with existing utilities and municipal or public services. This growth pattern would preserve sensitive habitat, open space, and farmland. Approximately 1.3 million acres of land would be protected and preserved, more than half of the region's land area. In 2016, less than half of the region's population lived in Mobility Hub areas, but by 2050, 53 percent will. Similarly, 71 percent of jobs and 54 percent of housing units will be located in Mobility Hub areas by 2050.

The proposed Plan would result in construction of additional housing. However, the areas the proposed Plan targets for construction of these additional housing units are largely within previously developed areas. Most of these areas have established roadways and utilities, as well as water and sewer services. The placement of additional housing units in established areas would require upgrading and resizing of existing infrastructure, including water facilities. The upgrading of these facilities would further remove obstacles to the construction of additional housing within and adjacent to these areas. Chapter 2, *Project Description*, and Section 4.14, *Population and Housing,* further describe forecasted population, housing unit, and job growth within the region.

The planned transportation network improvements of the proposed Plan are intended to expand upon the current transportation network by providing transportation investments that support compact land development patterns and decrease sprawl while reducing greenhouse gas (GHG) emissions and other environmental impacts. These transportation network improvements would remove obstacles to growth in

some areas of the region, which would support additional housing, population, and economic growth. Section 4.14 discusses forecasted regional population and employment growth associated with the proposed Plan.

7.2 MAXIMUM THEORETICAL BUILDOUT SCENARIO

7.2.1 BACKGROUND

Theoretical buildout scenario assumes maximum development allowed under the proposed Plan, pursuant to the maximum density and/or intensity specified in the adopted land use elements of local general plans (100 percent of allowable residential units and 100 percent of allowable non-residential square footage). Due to regulatory constraints, physical constraints, and foreseeable market conditions, realization of this scenario is not reasonably foreseeable and is highly unlikely; however, this EIR includes an analysis of this scenario for informational purposes because the jurisdictional land use plans associated with the proposed Plan land use forecast do provide the theoretical capacity for residential units and nonresidential building square footage up to this maximum. Table 7-1 compares 2050 housing units and jobs under the 2050 forecast of the proposed Plan with the maximum theoretical buildout scenario.

Table 7-1
Existing and Forecasted Job Growth by Jurisdiction

2050 Forecast	Proposed Plan	Maximum Theoretical Buildout	Percent increase relative to the proposed Plan
Housing Units	1,471,299	1,660,659	12.9%
Jobs	2,086,318	2,270,678	8.8%

Source: SANDAG 2021. Maximum Theoretical Buildout Scenario.

The maximum theoretical buildout scenario would represent a change in the level of residential and nonresidential development in the region. By 2050, it would result in approximately 189,360 additional housing units (approximately 12.9 percent more than the proposed Plan forecast) and approximately 184,360 additional jobs (approximately 8.8 percent more than the proposed Plan forecast) relative to forecasted growth under the proposed Plan. There would be no changes to the planned transportation network improvements and programs of the proposed Plan under this scenario.

The capacity of the maximum theoretical buildout scenario for housing units was estimated by either analyzing maximum plan density based on local adopted general plans (as of 2019) and any additional unit capacity from accessory dwelling units, or from Regional Housing Needs Allocation. For jobs, the Sustainable Communities Strategy (SCS) land use pattern was adjusted to accommodate all future employment in the region within the Mobility Hubs. Because this restricted job growth to a limited area in the region, this capacity was increased by 50 percent in order to provide enough subregional capacity for all future job growth. Given the generalized, highly theoretical nature of this buildout analysis, the analysis does not account for additional regulations, site-specific conditions, or other factors that would affect attainment of maximum allowable density or intensity on any given parcel. For example, parking requirements, slope and other land suitability characteristics, and implementation of environmental regulations would make attainment of maximum densities and/or intensities infeasible, and site-specific easements would restrict development of certain properties to levels below what is permitted by adopted plans. Another variable is that decision makers in each jurisdiction have the authority to approve, deny, or modify discretionary land use projects based on numerous site-specific factors.

The analysis excludes lands with specified developmental constraints, included but not limited to steep slopes (i.e., greater than 25 percent), Federal Emergency Management Agency (FEMA) 100-year floodplains and floodways, and conserved and preserved lands.

7.2.2 AESTHETICS AND VISUAL RESOURCES

Under the maximum theoretical buildout scenario, neighborhoods that are below maximum buildout would be subject to redevelopment to achieve buildout, and areas that are not forecasted for development under the proposed Plan would be developed to the maximum density or intensity. As such, the character and the aesthetic quality of many areas would be altered. New development and infrastructure would be established within and adjacent to scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings. Scenic vistas, as well as scenic resources within a State-designated scenic highway, would be altered, if not blocked completely in some areas, based on the construction of new buildings resulting from forecasted regional growth and land use change. Impacts would be greater with implementation of the maximum theoretical buildout scenario than with the proposed Plan. The greater amount of development under the theoretical buildout scenario would also substantially degrade the character of areas of the region, including adding a visual element of urban character to an existing rural or open space area. In addition, new development would create new light sources at night that would adversely affect dark skies in some locations. As with the proposed Plan, impacts on aesthetic resources would be reduced with the mitigation measures identified in Section 4.1, *Aesthetics and Visual Resources,* but would remain significant and unavoidable.

7.2.3 AGRICULTURAL AND FORESTRY RESOURCES

Impacts on agricultural lands, including areas with existing agricultural uses or lands with Williamson Act contracts, would be greater under the maximum theoretical buildout scenario. Lands with existing low-density residential uses that encourage or sustain agricultural operations would be developed to achieve maximum buildout and would no longer support agricultural operations. Additionally, a greater number of lands used for agricultural operations would be impacted by encroaching residential or commercial development. Areas adjacent to lands zoned for agricultural uses would be developed to achieve maximum density in such a way as to cause land use conflicts, as the nonagricultural uses would be in proximity to odors, runoff, and other effects. Impacts on agricultural lands would be greater than with implementation of the proposed Plan and greater than existing conditions.

Under the maximum theoretical buildout scenario, lands with existing low-density residential uses that include forest lands would be developed to achieve maximum buildout, and the theoretical buildout scenario would decrease acreage of forest lands in the region. As with the proposed Plan, impacts on agriculture and forestry resources would be reduced with the mitigation measures identified in Section 4.2, *Agriculture and Forestry Resources*, but would remain significant and unavoidable.

7.2.4 AIR QUALITY

Under maximum theoretical buildout conditions, regional growth and land use change would result in some increases in air pollutant emissions, but as with the proposed Plan, conflicts with applicable Air Quality Attainment Plans are unlikely.

Compared to the proposed Plan, maximum theoretical buildout would result in increased particulate emissions, both construction and operational. Therefore, maximum theoretical buildout would have greater potential to violate or contribute substantially to a violation of an air quality standard. In particular, emissions of fine and

respirable particulate matter (PM 2.5 and PM10, respectively) associated with maximum theoretical buildout scenario have greater potential to result in violations of California Ambient Air Quality Standards for these pollutants, or to contribute substantially to existing violations. The proposed Plan results in cumulatively considerable increases in emissions of the nonattainment pollutants PM10, a significant impact. Maximum theoretical buildout would increase the magnitude of this impact.

The proposed Plan's toxic air contaminant (TAC) emissions would expose sensitive receptors to substantial pollutant concentrations, a significant impact. Emissions of TACs under the maximum theoretical buildout scenario would increase due to increases in vehicle miles traveled (VMT). Compared to the proposed Plan, there would be increased exposure of sensitive receptors to substantial pollutant concentrations. As with the proposed Plan, significant air quality impacts would be reduced with the mitigation measures identified in Section 4.3, *Air Quality*, but would remain significant and unavoidable.

7.2.5 BIOLOGICAL RESOURCES

Impacts on biological resources would be greater under the maximum theoretical buildout scenario when compared to the proposed Plan. Under this scenario, areas that are vacant and not preserved or protected, or areas of low density would be developed to allow higher density and higher intensity uses. The conversion of undeveloped lands to developed lands would result in impacts on biological resources, affecting sensitive natural communities and potential regulated waters; special status plant and wildlife species, and regional corridors and movement. Mitigation measures to reduce these impacts are described in Section 4.4, *Biological Resources*, for the proposed Plan. However, those impacts would remain significant and unavoidable. The same mitigation measures would apply for the theoretical buildout scenario. The maximum theoretical buildout scenario would consist of more development than the proposed Plan, and although impacts on biological resources would be reduced with the mitigation identified in Section 4.4, they would remain significant and unavoidable.

The maximum theoretical buildout scenario would not conflict with approved local, regional, State, and federal regulations, policies, ordinances, and finalized Habitat Conservation Plans/Natural Community Conservation Plans (HCP/NCCPs). The maximum theoretical buildout scenario would result in less-than-significant impacts related to encroachment into hardline preserve areas identified by adopted HCP/NCCPs because, as with the proposed Plan, development projects would require biologically equivalent or superior compensation of habitat or project redesign when there is encroachment into hardline preserve areas. Therefore, that impact would be less than significant.

7.2.6 CULTURAL

Regional growth and land use changes forecasted under the maximum theoretical buildout scenario would result in ground disturbance that would occur during redevelopment and development of most of the region, including areas that are not planned for development under the proposed Plan. The area of ground disturbance would be greater than that anticipated under the proposed Plan, as areas not planned for regional growth and land use changes under the proposed Plan would be developed to their maximum densities. Development under the proposed Plan is more concentrated than it would be under maximum theoretical buildout. The likelihood of encountering historical resources or unique archeological resources is greatest on sites that have been minimally excavated in the past (e.g., undeveloped parcels, vacant lots, and lots containing surface parking, etc.). Previously excavated areas are generally considered to have a low potential for historic resources or unique archaeological resources, as the soil containing such resources has been removed. However, projects under the maximum theoretical buildout scenario likely would involve underground parking areas,

underground tanks, new pipelines, or replacement of pipelines, all at a lower depth than the previous development in previously graded areas, and in areas that were not previously developed. As such, additional significant ground disturbances are anticipated, and it is possible that more unique archeological resources would be disturbed.

Therefore, compared to the proposed Plan, a greater number of historical resources, or unique archeological resources would experience substantial adverse changes; this impact would continue to be significant. As with the proposed Plan, under maximum theoretical buildout, impacts related to disturbance of human remains would continue to be less than significant due to compliance with existing laws and regulations.

Section 4.5, *Cultural Resources* identifies mitigation measures that would reduce impacts on historical resources or unique archaeological resources. However, as with the proposed Plan, under maximum theoretical buildout these impacts would remain significant and unavoidable.

7.2.7 ENERGY

Under maximum theoretical buildout conditions, regional growth and land use change would increase overall energy consumption compared to the proposed Plan. Increased housing would result in additional construction-related energy consumption from the use of fuel for off-road equipment, worker commutes, and electricity consumption. Operational electricity consumption and natural gas use would also increase under maximum theoretical buildout conditions. However, Impact EN-1 is based on the per capita energy consumption, which would determine whether the energy use under maximum theoretical buildout conditions is more efficient than under the existing land uses and transportation network. As discussed in Section 4.6, *Energy,* the per capita energy consumption rates for the proposed Plan decrease by 17, 25, and 27 percent from 2016 to 2025, 2035, and 2050, respectively. Therefore, even with the somewhat increased energy consumption under maximum theoretical buildout conditions, the per capita rates would continue to be lower than existing conditions. This impact would be less than significant.

Federal, State, and regional agencies will continue to implement programs that improve energy efficiency, decrease reliance on fossil fuels, and increase reliance on renewable energy sources. SANDAG efforts will continue to support State goals through 2050. SANDAG and San Diego Gas & Electric (SDG&E) will continue to make efforts at the regional and local levels to increase the amount of renewable energy to meet energy demands. As with the proposed Plan, the maximum theoretical buildout conditions would not result in an increased reliance on fossil fuels and decreased reliance on renewable energy sources. The impact would be less than significant.

7.2.8 GEOLOGY, SOILS, AND PALEONTOLOGICAL RESOURCES

Regional growth and land use changes in the buildout forecasted in the maximum theoretical scenario would result in additional structures exposed to seismic hazards such as ground shaking, fault rupture, liquefaction, and earthquake-induced landslides; however, new buildings and utilities would be constructed according to existing State and local regulations to minimize geologic hazards. As with the proposed Plan, adherence to the laws, regulations, and programs included in Section 4.7.2 and project-specific investigations following State and local standards and practices would minimize risks to people or property as a result of the maximum theoretical buildout scenario. Therefore, impacts associated with geologic and seismic risks would be less than significant for the maximum theoretical buildout scenario, such as with the proposed Plan. However, impacts related to unstable soils, including expansive, collapsible, or unstable soils; landslides; and erosion or loss of topsoil would be significant under the maximum theoretical buildout scenario, as a result of the construction

of regional growth and land use changes located in erosion-prone areas. Impacts would be greater than those under the proposed Plan, as a greater number of regional growth projects would be constructed. As described in Section 4.7, *Geology, Soils, and Paleontological Resources,* adherence to the California Building Code (CBC), coastal zone regulations, construction general permit requirements, and local grading and erosion control ordinances would reduce the potential for substantial soil erosion or loss of topsoil, and impacts would be less than significant.

The maximum theoretical buildout scenario would result in more construction than under the proposed Plan, particularly development in areas within geologic formations of moderate to high paleontological resource potential and areas containing unique geologic resources, and disturbance would occur at a lower depth than the previous development in previously graded areas, which would increase potential impacts on paleontological resources and unique geological features. Compared to the proposed Plan, this increased development under maximum theoretical buildout would cause a greater number of unique paleontological resources and unique geological features to be destroyed; this impact would continue to be significant and unavoidable.

7.2.9 GREENHOUSE GAS EMISSIONS

Compared to existing conditions, the proposed Plan's GHG emissions would decrease for all horizon years (2025, 2035, and 2050). Under maximum theoretical buildout conditions, regional growth and land use change would result in some increases in GHG emissions, but there would still be net decreases compared to existing conditions.

Development under the maximum theoretical buildout scenario would likely continue in a similar pattern as under the proposed Plan, which encourages compact development, supporting rather than impeding adopted Climate Cation Plans (CAPs), GHG reduction plans, and/ or sustainability plans relevant to the proposed Plan. Because 2030 GHG emissions under the proposed Plan are higher than the AB 32-based regional reference point, emissions under maximum theoretical buildout are expected to continue to exceed this reference point, which would be a significant impact related to conflicts with AB 32.

Under maximum theoretical buildout, development would likely continue in a similar pattern as under the proposed Plan, which encourages compact development, although per capita GHG emissions from passenger vehicles would somewhat increase. However, the maximum theoretical buildout scenario would likely still achieve, and not conflict with, Senate Bill (SB) 375's per capita GHG emission reduction targets set by the California Air Resources Board (CARB) for the San Diego region.

The proposed Plan would be inconsistent with the State's ability to achieve 2045 and 2050 reference points of net zero and 5.2 million metric tons of carbon dioxide equivalence ($MMTCO_2e$), respectively (based on the goals of Executive Orders S-3-05 and B-55-18). Because GHG emissions would be higher under maximum theoretical buildout, these inconsistencies, which are a significant impact, would be worse. As with the proposed Plan, this would be reduced with the mitigation identified in Section 4.8, *Greenhouse Gas Emissions*, but impacts would remain significant and unavoidable.

7.2.10 HAZARDS AND HAZARDOUS MATERIALS

The increased construction that would occur under the maximum theoretical buildout scenario would lead to an increase in the risk of hazards to the public, schools, and/or the environment through the routine use, handling, transport, or disposal of hazardous materials. As with the proposed Plan, adherence to existing

regulations discussed in Section 4.9.2 would result in a less-than-significant impact related to hazardous emissions or handling hazardous materials during preconstruction, demolition, and/or construction activities for the theoretical buildout scenario. Regional growth and land use changes under the maximum theoretical buildout scenario would, similar to the proposed Plan, also result in air traffic hazards for people residing or working within an airport land use plan or within 2 miles of a public airport or public use airport. However, existing regulations, Federal Aviation Administration (FAA) procedures, Airport Land Use Compatibility Plans (ALUCPs), and Air Installation Compatible Use Zone (AICUZ) studies ensure compatibility between uses and reduce the potential for aircraft accidents and would result in a less-than-significant impact.

Additionally, regional growth and land use changes would result in development of parcels that are not proposed under the proposed Plan, and redevelopment would occur at higher densities, which would cause obstruction for emergency response vehicles or result in activities that would cause physical interference in the implementation of emergency response and evacuation plans or interfere with adequate emergency access. However, associated development projects under the theoretical buildout scenario would be required to comply with existing regulations to reduce such hazards, as described in Section 4.9, *Hazards and Hazardous Materials,* and would be considered less than significant.

7.2.11 HYDROLOGY AND WATER QUALITY

The maximum theoretical buildout scenario would result in development and redevelopment throughout the region, at a greater level than under the proposed Plan. New areas of impermeable surface would be created as vacant or undisturbed areas would be paved; there would be changes in absorption rates, drainage patterns, groundwater infiltration, or the rate of surface runoff; and water and groundwater quality would be diminished. Because new construction and development would be required to comply with federal, State, and local regulations governing water quality and pollution prevention, as described in Section 4.10, *Hydrology and Water Quality,* as with the proposed Plan, all hydrology and water quality impacts associated with maximum theoretical buildout would be less than significant.

Development projects associated with the proposed Plan would be evaluated for the potential for damage from flooding and other associated hazards. Existing planning and design standards and regulations, such as project-specific technical studies, existing and updated emergency evacuation plans, water tank safety requirements, and other similar and applicable safety design considerations, would serve to address and minimize these potential impacts. Although a greater number of projects would be constructed under the maximum theoretical buildout scenario, and therefore a greater number of projects would be at risk from flooding, seiche, tsunami, or mudflow, existing standards and regulations would continue to apply. Therefore, impacts associated with hydrology and water quality would also be considered less than significant under the maximum theoretical buildout scenario.

7.2.12 LAND USE

Under the maximum theoretical buildout scenario, there would be more regional growth and land use change than under the proposed Plan. Under the proposed Plan, regional growth and land use change would not physically divide an established community or cause significant impacts (not evaluated elsewhere in the EIR) due to conflicts with land use plans, and these impacts would be less than significant. Given the limited amount of additional development, regional growth and land use change impacts would continue to be less than significant under maximum theoretical buildout conditions. However, transportation network improvement land use impacts relating to physical division of an established community would continue to be significant and unavoidable as with the proposed Plan.

Like the proposed Plan, because the maximum theoretical build out scenario assumes maximum development allowed under the proposed Plan, it would not conflict with land use plans, policies and regulations, including general plans, specific plans, and community plans adopted for the purpose of avoiding or mitigating an environmental effect.

7.2.13 MINERAL RESOURCES

Under the maximum theoretical buildout scenario, additional vacant or undeveloped land in areas with known mineral resources or locally important resource recovery sites would be developed, restricting the ability to extract mineral resources in those areas. As with the proposed Plan, impacts on the availability of known mineral resources or locally important resource recovery sites would be reduced with the mitigation identified in 4.12, *Mineral Resources*, but would remain significant and unavoidable.

7.2.14 NOISE AND VIBRATION

The maximum theoretical buildout scenario would result in more regional growth and land use change than associated with the proposed Plan. The increased development density would increase the number of persons exposed to noise levels exceeding State and local noise standards. This increase in development would also generate noise levels that would increase ambient noise levels, and further expose noise-sensitive receptors to substantial temporary and permanent increases in ambient noise levels from construction and operation. The increased level of residential and nonresidential development under the maximum theoretical buildout scenario would result in an increase of new residents, visitors, and workers in the region compared to the proposed Plan, which would thereby increase vehicle trips on area roadways, increasing traffic noise levels. Increased construction and transportation trips under the maximum buildout scenario would increase vibration and groundborne noise generated in proximity to sensitive receptors. As with the proposed Plan, impacts would be reduced with the mitigation identified in Section 4.13, *Noise and Vibration*, but would remain significant and unavoidable.

Compliance with local jurisdiction general plans and FAA standards would reduce noise from airstrips and ensure land use compatibility with any new development, including additional development under the maximum theoretical buildout scenario. As such, impacts would remain less than significant under the maximum theoretical buildout scenario.

7.2.15 POPULATION AND HOUSING

To achieve the maximum theoretical buildout scenario, an increase in the overall level of housing and nonresidential development would occur region-wide. This would induce additional unplanned growth in some areas of the San Diego Region beyond the unplanned growth anticipated with the proposed Plan. Greater levels of development and conversion to higher densities would also lead to displacement of residents and housing units, and potentially necessitate the construction of replacement housing, as older existing residential units are replaced. As with the proposed Plan, some impacts would be reduced with the mitigation identified in Section 4.14, *Population and Housing*, but would remain significant and unavoidable.

7.2.16 PUBLIC SERVICES AND UTILITIES

Maximum theoretical buildout would lead to increased regional growth and land use change within the region. This growth would require an increase of public services and recreational facilities, such as fire and police protection, schools, and libraries. This growth would also increase demands on governmental facilities, recreational facilities, wastewater collection and treatment facilities, stormwater drainage facilities, electric

power, natural gas, telecommunications, and/or solid waste facilities, which would in turn necessitate the construction of additional or improved public facilities to maintain service ratios, and/or other performance standards. As with the proposed Plan, impacts on public services would be reduced with the mitigation identified in Section 4.15, *Public Services and Utilities*, but would remain significant and unavoidable.

Additionally, with increased regional growth and land use changes, there would be more demand for utilities such as wastewater treatment facilities, stormwater drainage facilities, electric power, natural gas, telecommunication facilities, and/or solid waste disposal facilities under the maximum theoretical buildout scenario. The construction of new or expanded utility facilities would cause significant environmental impacts in order to maintain service levels, such as facility capacity. As with the proposed Plan, impacts on utilities would be reduced with the mitigation identified in Section 4.15 but would remain significant and unavoidable.

7.2.17 TRANSPORTATION

The maximum theoretical buildout scenario would increase demand on transportation systems compared to the proposed Plan. The proposed Plan would decrease VMT per capita below Base Year (2016) conditions. Due to the increased regional growth and land use change under maximum theoretical buildout, this scenario would not decrease VMT per capita further beyond what is anticipated under the proposed Plan and would increase total VMT compared to the proposed Plan. Impacts under the maximum theoretical buildout scenario, as with the proposed Plan, would be significant and unavoidable, even after the mitigation measures described in Section 4.16, *Transportation,* are applied.

As with the proposed Plan, implementation of regional growth and land use changes under maximum theoretical buildout would not induce substantial vehicle travel because transportation network improvements would be the same. Maximum theoretical buildout would also cause a greater percentage of peak period transit and walk/bike trips to work, a greater percentage of jobs within proximity to high frequency transit stops and bike facilities, and substantially more daily transit boardings. The percentage of population within 0.5 mile of a transit stop and average peak period travel time to work on transit would increase under the maximum theoretical buildout, but the performance of public transit, bicycle, or pedestrian facilities would not decrease. As such, the characteristics of the maximum theoretical build out, as with the proposed Plan, are generally consistent with applicable plans and policies and would not conflict with them.

Implementation of the proposed Plan would not change applicable design standards and transportation network improvements would be designed consistent with those standards. Likewise, the maximum theoretical buildout is not expected to change applicable design standards either and would be consistent with applicable standards.

Finally, as with the proposed Plan, the maximum theoretical buildout scenario would not lead to a lack of parking supply that would cause significant secondary environmental impacts not already accounted for.

7.2.18 TRIBAL CULTURAL RESOURCES

Regional growth and land use changes forecasted under the maximum theoretical buildout scenario would result in ground disturbance that would occur during redevelopment and development of most of the region, including areas that are not planned for development under the proposed Plan. The area of ground disturbance would be greater than that anticipated under the proposed Plan, as areas not planned for regional growth and land use changes under the proposed Plan would be developed to their maximum densities. Development under the proposed Plan is more concentrated than it would be under maximum theoretical buildout. The

likelihood of encountering tribal cultural resources is greatest on sites that have been minimally excavated in the past (e.g., undeveloped parcels, vacant lots, and lots containing surface parking, etc.). Projects under the maximum theoretical buildout scenario likely would involve underground parking areas, underground tanks, new pipelines, or replacement of pipelines, all at a lower depth than the previous development in previously graded areas, and in areas that were not previously developed. As such, additional significant ground disturbances are anticipated, and it is possible that more tribal cultural resources would be disturbed.

Therefore, compared to the proposed Plan, a greater number of tribal cultural resources would experience substantial adverse changes; this impact would continue to be significant.

Section 4.17, *Tribal Cultural Resources,* identifies mitigation measures that would reduce impacts on tribal cultural resources. However, as with the proposed Plan, under maximum theoretical buildout these impacts would remain significant and unavoidable.

7.2.19 WATER SUPPLY

The maximum theoretical buildout scenario would increase water demand compared to the proposed Plan. A greater amount of water would be needed for the construction and operation of residential and nonresidential development, developed park space, and other necessary developments to accommodate this regional growth. The increased growth under the maximum theoretical buildout scenario would lead to increased water demands such that water supplies would be inadequate to serve these demands, and new or expanded water supplies or entitlements would be required. In addition, continued growth under the maximum theoretical buildout scenario would further impede groundwater basin sustainability. As with the proposed Plan, this water supply impact would be reduced with the mitigation identified in Section 4.18, *Water Supply*, but would remain significant and unavoidable.

Under the proposed Plan, regional growth and land use change would result in the construction of additional new water facilities or the expansion of existing facilities to adequately meet forecasted demand or capacity needs, the construction of which would cause significant environmental effects. Increased water demands under maximum theoretical buildout would accelerate the need for new or expanded water facilities. As with the proposed Plan, this impact would be reduced with the mitigation identified in Section 4.18 but would remain significant and unavoidable.

7.2.20 WILDFIRE

Given the relatively large amount of area within the San Diego region considered at high risk for wildland fires, additional regional growth and land use change under the maximum theoretical buildout scenario would expose additional people and structures to a significant risk of loss, injury, or death involving wildland fires. Adherence to the regulations described in Section 4.19.2 would reduce impacts associated with wildland fires to a degree but not to a level less than significant. Also, as with the proposed Plan, impacts would be reduced with the mitigation identified in Section 4.19, *Wildfire*, but the following impacts would remain: increased exposure of people and structures to risk of loss, injury, or death involving wildland fires; installation of infrastructure that may exacerbate fire risk; and conversion of land that would expose people or structures to other significant risks associated with wildfires. Impacts would be significant and unavoidable.

7.3 SIGNIFICANT IRREVERSIBLE IMPACTS

Implementation of the proposed Plan would result in permanent changes to the existing environments, which have been described throughout this EIR. While the proposed Plan focuses population and employment growth

in Mobility Hubs and existing urban areas while also providing transportation investments that support compact land development patterns and reduce sprawl, there will still be some conversion of undeveloped land to urbanized uses. These conversions are considered a permanent irreversible change and would occur directly through construction of development on undeveloped land. Land use changes and transportation network improvements would result in significant irreversible impacts on aesthetics and visual resources, including changes to existing community character and views. Future development projects associated with the proposed Plan would result in a direct irreversible loss of sensitive vegetation communities that supports rare, threatened, or endangered species, and impacts on these resources would be significant and irreversible. The development of currently undeveloped land and other land use changes would result in significant irreversible impacts on agricultural resources and forest lands, and the availability of known mineral resources. The proposed Plan would substantially induce irreversible population growth and increased density, which would displace existing housing units, and result in additional people that would be susceptible to noise impacts. As development occurs at urban edges, additional people and structures would be at risk from wildland fires.

The proposed Plan's regional growth and land use changes would result in the irreversible consumption of nonrenewable resources. This use will have an incremental and irreversible effect on such resources. The irreversible commitment of limited resources is inherent in any development project or, in the case of the proposed Plan, aggregated development projects. Resources anticipated to be irreversibly committed over the timespan of the proposed Plan include, but are not limited to, lumber and other related forest products; sand, gravel, and concrete; petrochemicals; construction materials; steel, copper, lead, and other metals; and water. Development associated with the proposed Plan represents a long-term commitment to the consumption of fossil fuel oil and natural gas. These increased energy demands relate to construction, lighting, heating, and cooling of residences and buildings, as well as construction and operation of transit systems.

7.4 SIGNIFICANT AND UNAVOIDABLE IMPACTS

Based on the analysis detailed in Chapter 4 of this EIR, implementation of the proposed Plan would result in significant and unavoidable impacts for the resource topics shown in Table 7-2. As required by CEQA Guidelines Section 15126.1(c), significant and unavoidable impacts listed in this table are described in further detail in the relevant sections of Chapter 4. Table 7-2 identifies significant and unavoidable impacts for each horizon year (2025, 2035, and 2050).

With respect to land use changes implemented by local jurisdictions and transportation network improvements implemented by other transportation project sponsors, SANDAG has no authority to require implementing agencies to implement or enforce project-specific mitigation measures. In addition, some programmatic mitigation may not be feasible or effective for particular projects based on project or site-specific circumstances. This results in many significant impacts being significant and unavoidable.

In each resource area section, this EIR identifies mitigation measures that generally are performance standards-based, which SANDAG shall and other implementing agencies "can and should" comply with in mitigating project-specific impacts. Where applicable, SANDAG then identifies examples of project-level mitigation measures that may be required by lead agencies, to meet performance standards. Lead agencies may also identify other comparable measures capable of reducing impacts below the specified threshold. SANDAG cannot require other lead agencies to adopt mitigation, and it is ultimately the responsibility of the lead agency to determine and adopt project specific mitigation as appropriate and feasible for each individual project. As a result, this EIR concludes significant and unavoidable for many impacts where SANDAG does not have authority to implement or enforce project- specific mitigation measures, or where State action might be needed reduce impacts to less-than-significant levels.

Table 7-2
Significant and Unavoidable Impacts

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
4.1 Aesthetics and Visual Resources				
AES-1 Have a substantial adverse effect on a scenic vista Significant impact in 2025, 2035, and 2050	**AES-1a Protect Public Views of Scenic Vistas for Transportation Network Improvements** **AES-1b Protect Public Views of Scenic Vistas for Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
AES-2 Substantially damage scenic resources, including, but not limited to, trees, rocks, outcroppings, and historic structures within a state scenic highway Significant impact in 2025, 2035, and 2050	**AES-1a Protect Public Views of Scenic Vistas for Transportation Network Improvements** **AES-2a Reduce Impacts on Scenic Resources within a State Scenic Highway and Local Scenic Resources for Transportation Network Improvements** **AES-2b Reduce Impacts on Scenic Resources within a State Scenic Highway and Local Scenic Resources for Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
AES-3 Substantially degrade the existing visual character or quality of public views of the site and its surroundings, including adding a visual element of urban character to an existing rural or open space area, conflicting with regulations governing scenic quality Significant impact in 2025, 2035, and 2050	**AES-1a Protect Public Views of Scenic Vistas for Transportation Network Improvements** **AES-2a Reduce Impacts on Scenic Resources within a State Scenic Highway and Local Scenic Resources for Transportation Network Improvements** **AES-2b Reduce Impacts on Scenic Resources within a State Scenic Highway and Local Scenic Resources for Development Projects** **AES-3a Reduce Impacts on Visual Character for Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	AES-3b Reduce Impacts on Visual Character for Development Projects			
AES-4 Substantially degrade the existing visual character or quality of public views of the site and its surroundings by creating a new source of substantial light or glare that would adversely affect day or nighttime views Significant impact in 2025, 2035, and 2050	**AES-4a Minimize Effects of Light and Glare for Transportation Network Improvements** **AES-4b Minimize Effects of Light and Glare for Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.2 Agricultural and Forestry Resources				
AG-1 Convert agricultural lands to nonagricultural use Significant impact in 2025, 2035, and 2050	**AG-1a Preserve Existing Agricultural Lands** **AG-1b Reduce Transportation Network Improvement and Development Conflicts with Agricultural Operations**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
AG-2 Conflict with existing zoning for agricultural use, or a Williamson Act contract Significant impact in 2025, 2035, and 2050	**AG-1a Preserve Existing Agricultural Lands** **AG-1b Reduce Transportation Network Improvement and Development Conflicts with Agricultural Operations**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
FR-1 Convert or result in the loss of "Forest Land" as defined in the California Forest Legacy Act of 2007 (Public Resources Code Section 12220(g)) Significant impact in 2025, 2035, and 2050	**FR-1 Reduce Impacts on Forest Lands** **BIO-1a Implement Design, Minimization, and Avoidance Measures for Sensitive Natural Communities and Regulated Aquatic Resources** **BIO-1b Provide Compensatory Mitigation** **BIO-1e Implement Best Management Practices to Avoid Indirect Impacts**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.3 Air Quality				
AQ-2 Result in a cumulatively considerable net increase in nonattainment criteria pollutants, including VOC, NO_X, PM10, PM2.5, and SO_X	**AQ-2a Secure Incentive Funding** **AQ-2b Zero Emission Trains** **GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG**	Not applicable	Not applicable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
Significant impact in 2050	**Emissions and for Updates to CAPs or GHG Reduction Plans** **GHG-5b Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure** **GHG-5d Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide** **GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects** **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects**			
AQ-3 Result in construction-related emissions above regional mass emission thresholds Significant impact in 2025, 2035, and 2050	**AQ-3a Implement Construction Best Management Practices for Fugitive Dust** **AQ-3b Reduce Diesel Emissions During Construction from Off-Road Equipment** **AQ-3c Reduce Diesel Emissions from On-Road Vehicles** **GHG-5e Implement Measures to Reduce GHG Emissions from Transportation Projects** **GHG-5f Implement Measures to Reduce GHG Emissions from Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
AQ-4 Expose sensitive receptors to substantial PM10 and PM2.5 concentrations Significant impact in 2025, 2035, and 2050	**AQ-2a Secure Incentive Funding** **AQ-4 Reduce Exposure to Localized Particulate and/or TAC Emissions** **GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	GHG-5b Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure **GHG-5d Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide** **GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects** **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects**			
AQ-5 Expose sensitive receptors to substantial TAC concentrations Significant impact in 2025, 2035, and 2050	**AQ-2a Secure Incentive Funding** **AQ-4 Reduce Exposure to Localized Particulate and/or TAC Emissions** **AQ-5a Reduce Exposure to Localized Toxic Air Contaminant Emissions** **AQ-5b. Reduce Exposure to Localized Toxic Air Contaminant Emissions during Railway Design** **GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans** **GHG-5b Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure** **GHG-5d Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide** **GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects			
4.4 Biological Resources				
BIO-1 Have a substantial adverse effect on any sensitive natural communities identified in local or regional plans, policies, regulations, or by CDFW or USFWS; or have a substantial adverse effect on state or federally regulated waters and wetlands through direct removal, filling, hydrological interruption, or other means Significant impact in 2025, 2035, and 2050	**BIO-1a Implement Design, Minimization, and Avoidance Measures for Sensitive Natural Vegetation Communities and Regulated Aquatic Resources** **BIO-1b Provide Compensatory Mitigation** **BIO-1c Prepare a Habitat Restoration Plan** **BIO-1d Prepare Habitat / Long-Term Management Plans** **Bio-1e Implement Best Management Practices to Avoid Indirect Impacts**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
BIO-2 Have a substantial adverse effect, either directly or indirectly, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or listed by CDFW or USFWS, including their federally designated critical habitat, or species that are considered sensitive in CEQA Guidelines Section 15380 Significant impact in 2025, 2035, and 2050	**BIO-2a Implement Design, Minimization, and Avoidance Measures for Special-Status Animal Species** **BIO-2b Provide Compensatory Mitigation for Special-Status Plant Species** **BIO-2c Provide Compensatory Mitigation for Special-Status Animal Species** **BIO-1a Implement Design, Minimization, and Avoidance Measures for Sensitive Natural Vegetation Communities and Regulated Aquatic Resources** **BIO-1b Provide Compensatory Mitigation** **BIO-1c Prepare a Habitat Restoration Plan** **BIO-1d Prepare Habitat / Long-Term Management Plans**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
BIO-3 Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with	**BIO-3 Facilitate Wildlife Movement**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites Significant impact in 2025, 2035, and 2050				
4.5 Cultural Resources				
CULT-1 Cause a substantial adverse change in the significance of a historical resource or unique archaeological resource Significant impact in 2025, 2035, and 2050	**CULT-1a Develop Project-Level Measures for Development Projects and Transportation Network Improvements** **CULT-1b Implement Monitoring and Data Recovery Programs for Development Projects and Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.6 Energy				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
4.7 Geology, Soils, and Paleontological Resources				
PALEO-1 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature Significant impact in 2025, 2035, and 2050	**PALEO-1a Identify the Potential for Unique Paleontological Resources or Unique Geologic Features for Development Projects or Transportation Network Improvements** **PALEO-1b Avoid or Reduce Impacts on Unique Paleontological Resources or Unique Geologic Features for Development Projects or Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.8 Greenhouse Gas Emissions				
GHG-5 Be inconsistent with the State's ability to achieve the 2030 reduction target of SB 32 and long-term reduction goals of Executive Orders S-3-05 and B-55-18 Significant impact in 2030, 2045, and 2050	**GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans** **GHG-5b Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure**	Significant and Unavoidable (in 2030)	Significant and Unavoidable (in 2045)	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	GHG-5c Implement Nature-Based Climate Solutions to Remove Carbon Dioxide from the Atmosphere **GHG-5d Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide** **GHG-5e Implement Measures to Reduce GHG Emissions from Transportation Projects** **GHG-5f Implement Measures to Reduce GHG Emissions from Development Projects** **AQ-3b Reduce Diesel Emissions During Construction from Off-Road Equipment** **AQ-3c Reduce Diesel Emissions from On-Road Vehicles** **AQ-4 Reduce Exposure to Localized Particulate and/or TAC Emissions** **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects** **WS-1a Implement Water Conservation Measures for Transportation Network Improvements** **WS-1b Implement Water Conservation Measures for Development Projects**			
4.9 Hazards and Hazardous Materials				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
4.10 Hydrology and Water Quality				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
4.11 Land Use				
LU-1 Physically divide an established community	**LU-1 Provide Access and Connections for Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
Significant impact in 2025, 2035, and 2050				
4.12 Mineral Resources				
MR-1 Result in the loss of availability of known aggregate and mineral resources supply sites that would be of value to the region and the residents of the state, or result in the loss of availability of a locally-important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan Significant impact in 2025, 2035, and 2050	**MR-1a Conserve Aggregate and Mineral Resources During Planning and Design of Development Projects** **MR-1b Conserve Aggregate and Mineral Resources During Planning and Design of Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.13 Noise and Vibration				
NOI-1 Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies; or generate a substantial absolute increase in ambient noise Significant impact in 2025, 2035, and 2050	**NOI-1a Implement Construction Noise Reduction Measures for Development Projects and Transportation Network Improvements** **NOI-1b Implement Operational Noise Reduction Measures for Transportation Network Improvements** **NOI-1c Implement Operational Noise Reduction Measures for Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
NOI-2 Generation of excessive groundborne vibration or groundborne noise levels Significant impact in 2025, 2035, and 2050	**NOI-2a Implement Construction Groundborne Vibration and Noise Reduction Measures** **NOI-2b Implement Groundborne Vibration and Noise-Reducing Measures for Rail Operations**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.14 Population and Housing				
POP-1 Induce substantial unplanned population growth to areas of the region either directly (e.g., by proposing new homes and businesses) or indirectly	No feasible mitigation	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
(e.g., by extending roads and other infrastructure) Significant impact in 2025, 2035, and 2050				
POP-2 Displace substantial numbers of people or housing units, which would necessitate the construction of replacement housing elsewhere Significant impact in 2025, 2035, and 2050	**POP-2a Design Development Projects to Reduce Displacement** **POP-2b Design Transportation Network Improvement Projects to Reduce Displacement**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.15 Public Services and Utilities				
PS-1 Result in substantial adverse physical impacts associated with the provision of or need for new or physically altered (i.e., expanded) public facilities, in order to maintain adequate fire and police protection, emergency services, schools, libraries, and recreation facilities Significant impact in 2025, 2035, and 2050	**PS-1 Implement Mitigation Measures for New/Expanded Public Service Facilities**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
REC-1 Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated Significant impact in 2025, 2035, and 2050	**REC-1 Implement Mitigation Measures for Parks and other Recreational Facilities**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
U-1 Result in the expansion, relocation, or construction of wastewater collection and treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities to adequately meet projected capacity needs, the construction of which could cause significant environmental impacts Significant impact in 2025, 2035, and 2050	**U-1a Implement Mitigation Measures for New/Expanded Wastewater, Stormwater, Electrical, Natural Gas, and Telecommunications Facilities Associated with Development Projects** **U-1b Implement Mitigation Measures for New/Expanded Stormwater Facilities Associated with Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
U-2 Generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure; negatively impact the provision of solid waste services or impair the attainment of solid waste reduction goals; or fail to comply with federal, state, and local management and reduction statutes and regulations related to solid waste Significant impact in 2035 and 2050.	**U-2a Implement Mitigation Measures for New/Expanded Solid Waste Facilities** **U-2b Reduce Construction Waste** **U-2c Reduce Operational Waste**	Not applicable	Significant and Unavoidable	Significant and Unavoidable
4.16 Transportation				
TRA-2 Conflict or be inconsistent with CEQA Guidelines Section 15064.3 by not achieving the substantial VMT reductions needed to help achieve statewide GHG reduction goals Significant impact in 2025, 2035, and 2050	**TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects** **GHG-5a Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans** **GHG-5d Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide** **GHG-5f Implement Measures to Reduce GHG Emissions from Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
4.17 Tribal Cultural Resources				
TCR-1 Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 that is either (1) listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or	**TCR-1a Implement Tribal Cultural Resources Mitigation Measures for Development Projects and Transportation Network Improvements** **TCR-1b Implement Monitoring and Mitigation Programs for Development Projects and Transportation Network Improvements**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
(2) determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1 Significant impact in 2025, 2035, and 2050				
4.18 Water Supply				
WS-1 Not have sufficient water supplies available to serve the projected regional demand during normal, dry and multiple dry years Significant impact in 2050	**WS-1a Implement Water Conservation Measures for Transportation Network Improvements** **WS-1b Implement Water Conservation Measures for Development Projects** **WS-1c Ensure Adequate Water Supply for Development Projects**	Not applicable	Not applicable	Significant and Unavoidable
WS-2 Substantially decrease groundwater supplies, or interfere substantially with groundwater recharge such that the proposed Plan would impede sustainable management of groundwater basins or obstruct implementation of a sustainable groundwater management plan Significant impact in 2025, 2035, and 2050	**WS-1a Implement Water Conservation Measures for Transportation Network Improvements** **WS-1b Implement Water Conservation Measures for Development Projects** **WS-2 Implement Groundwater Measures to Ensure Sustainable Yield for Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
WS-3 Require or result in the relocation or construction of new or expanded water facilities, the construction or relocation of which could cause significant environmental effects Significant impact in 2025, 2035, and 2050	**WS-1a Implement Water Conservation Measures for Transportation Network Improvements** **WS-1b Implement Water Conservation Measures for Development Projects** **WS-1c Ensure Adequate Water Supply for Development Projects** **WS-2 Implement Groundwater Measures to Ensure Sustainable Yield for Development Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Impacts of the Proposed Plan in 2025, 2035, and 2050	Mitigation Measures	Level of Significance After Mitigation		
		2025	2035	2050
	WS-3 Implement Measures for New or Expanded Water Facilities			
4.19 Wildfire				
WF-1 Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire; or expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires Significant impact in 2025, 2035, and 2050	**WF-1 Reduce Wildfire Risk for Development and Transportation Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
WF-2 Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment Significant impact in 2025, 2035, and 2050	**WF-2 Reduce Wildfire Risk Related to Wildfire-Associated Infrastructure Required to Support Development or Transportation Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable
WF-3 Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes Significant impact in 2025, 2035, and 2050	**WF-3 Reduce Post-Fire Risks Related to Flooding, Landslides, Slope Instability, or Drainage Changes for Development and Transportation Projects**	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

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8.7 SECTION 4.5, CULTURAL RESOURCES

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9 PREPARERS OF THE ENVIRONMENTAL DOCUMENT

9.1 SANDAG

Keith Greer	Principal Regional Planner
Kirsten Uchitel	Project Manager
Samantha Foulke	Associate Legal Counsel
Elisa Arias	Director of Integrated Transportation Planning
Adam Attar	Associate Researcher and Modeler
Joshua Clark	Associate Regional Planner
Coleen Clementson	Director of Regional Planning
Grace Chung	Senior GIS Analyst
Ryan Chung	Associate Graphic Designer
Jane Clough	Senior Regional Planner
Rachel Cortes	Senior Researcher and Modeler
Rick Curry	Manager of Regional Models
Tuere Fa'aola	Principal Regional Planner
Susan Freedman	Senior Regional Planner
Andrew Gordon	Senior GIS Analyst
Katie Hentrich	Associate Regional Planner
Tom King	Associate Researcher and Modeler
Pat Landrum	Director II of Data and Modeling
Brian Lane	Senior Regional Planner
Anna Lowe	Senior Regional Planner
Antoinette Meier	Mobility and Innovation Director
Joaquin Ortega	Associate Researcher and Modeler
Ziying Ouyang	Senior Researcher and Modeler

Sarah Pierce	Associate Regional Planner
Keri Robinson	Senior Regional Planner
Rob Rundle	Principal Regional Planner
Samual Sanford	Senior Regional Planner
Kim Smith	Senior Regional Planner
Lisa Starace	Business Services Supervisor
David Tedrow	Manager of Regional Models
Karyn Thompson	Associate Graphic Designer
Phil Trom	Regional Planning Program Manager
Allison Wood	Senior Regional Planner
Allison Woodworth	Regional Planner II
Anna Van	Associate Regional Planner
Daniel Veeh	Senior Regional Planner
Andrea Villyard	Associate Marketing Analyst
Daniel Zavala	Intern, Engineering and Construction

9.2 ICF

Michael Amling	Project Director/Principal-in-Charge
Kathie Washington	Project Manager
Vincent Tong	Deputy Project Manager/Senior Planner
Rich Walter	Senior Advisor, QA/QC
Kelly Ross	Environmental Planner
Tristan Evert	Environmental Planner
Emily Seklecki	Environmental Planner
Claudia Watts	Environmental Planner
Emily Pacholski	Environmental Planner

Mary Bilse	Environmental Planner
Matthew McFalls	Air Quality/Health Risk Lead
Seth Hartley	Air Quality/Health Risk Lead
Gregory Carter	Air Quality Specialist
Hannah Eglinton	Air Quality Specialist
Pierre Glaize	Air Quality Specialist
Christopher Holder	Air Quality Specialist
Samuel Kovach	Air Quality Specialist
Alicia Murphy	Air Quality Specialist
Logan Pfeiffer	Air Quality Specialist
Delaney Reilly	Air Quality Specialist
Lynn Socha	Air Quality Specialist
Chengyang Wang	Air Quality Specialist
Kristy Weber	Air Quality Specialist
Elliott Wezerek	Air Quality/ Energy Specialist
Wanchen Xiong	Air Quality Specialist
Pat Atchison	Biological Resources Specialist
Meris Guerrero	Regulatory Specialist
Dick Rol	Biological Resources Specialist
Karen Crawford	Cultural Resources Specialist
Timothy Yates	Cultural Resources Specialist
Jamie Genevie	Climate Change Specialist
Kirsten Jaglo	Climate Change Specialist
Jamie Liu	Climate Change Specialist
Margaret Messerschmidt	Climate Change Specialist

Joanne Potter	Climate Change Specialist
Beth Rodehorst	Climate Change Specialist
Brittany Buscombe	GIS Specialist
Andy Belcourt	GIS Specialist
Bill Parker	GIS Specialist
Greg Nichols	GIS Specialist
Brad Stein	GIS Specialist
Debbie Turner	GIS Specialist
Teal Zeisler	GIS Specialist
Katrina Sukola	Hydrology and Water Quality Specialist
Meagan Flacy	Hydrology and Water Quality Specialist
Peter Hardie	Noise Specialist
Jonathan Higginson	Noise Specialist
Kenneth Cherry	Technical Editor
Jenelle Mountain-Castro	Publications Specialist

9.3 ASCENT ENVIRONMENTAL, INC.

Poonam Boparai	Greenhouse Gas Emissions Specialist
Andrew Martin	Greenhouse Gas Emissions Specialist
Julie Wilson	Greenhouse Gas Emissions Specialist

9.4 THE BODHI GROUP, INC.

Sree Gopinath, PE	Geology and Solis and Hazards, Hazardous Materials Specialist

9.5 INTERSECTING METRICS

Stephen Cook	Transportation Specialist

9.6 PALEO SOLUTIONS, INC.

Courtney Richards	Paleontological Resources Specialist

9.7 SCHAEFER ECOLOGICAL SERVICES

Christina Schaefer	Biological Resources Specialist

9.8 TTG ENVIRONMENTAL & ASSOCIATES

Teresa Wilkinson	Environmental Planner
Kim Baranek	Environmental Planner
Bill Graham	Environmental Planner
Kirstin Skadberg	Environmental Planner