

SANDAG

SAN DIEGO AND IMPERIAL COUNTIES SUSTAINABLE FREIGHT IMPLEMENTATION STRATEGY

FEBRUARY 2024

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1. EXECUTIVE SUMMARY

The San Diego and Imperial Counties Sustainable Freight Implementation Strategy (Sustainable Freight Strategy) analyzes and prioritizes innovative strategies for implementation to improve the efficiency and sustainability of goods within the San Diego Association of Governments (SANDAG) and Imperial County Transportation Commission (ICTC) region.

This report outlines the analysis of the system's existing conditions and proposes several key strategies for implementation via five projects, three programs, and three policies. While these key strategies serve as a baseline for improving the supply chain network, additional innovative strategies have been assessed and outlined for implementation in future scenarios.

Additionally, the Workforce Development Toolkit in this report addresses current and projected needs for continued progress and adoption of strategies to improve the supply chain network by maintaining adequate employment and fulfilling future employment needs and opportunities.

1.1 Goals & Objectives

The goal of the Sustainable Freight Strategy is to create a more sustainable supply chain network through regional freight projects and policies that reduce emissions while fostering trade.

The objectives of the Sustainable Freight Strategy include the following:

- Develop partnerships with public and private sectors
- Address environmental justice concerns from freight impacts
- Pilot innovative technologies
- Identify funding opportunities for implementation
- Address workforce gaps in implementing new technologies

1.2 Key Findings & Recommendations

The freight network within San Diego and Imperial Counties is actively advancing towards a more sustainable future. This report summarizes several pivotal findings that are poised to play a crucial role in facilitating and expediting the transition to a sustainable freight system. These key findings collectively contribute to a nuanced understanding of the current landscape and illuminate strategic pathways for sustainable development.

By identifying interventions that align with environmental objectives, community needs, and economic vitality, this report serves as a valuable guide for stakeholders aiming to navigate the complexities of sustainable freight implementation. The insights garnered from this report are instrumental in acknowledging the progress made and providing actionable recommendations to propel the freight network toward a future characterized by resilience, efficiency, and environmental responsibility.

The Sustainable Freight Strategy report highlights 11 key projects, programs, and policies aiming to enhance the regional freight system. These recommendations span multimodal infrastructure, technology adoption, and efficiency incentives, representing improvements across various study locations.

A Workforce Development Toolkit has been crafted to assess the current and projected regional workforce pertaining to the sustainable freight industry. The toolkit contains a labor market analysis and an inventory of pertinent training programs. To meet the needs of sustainable freight projects and programs, the labor market analysis identifies gaps in specialized skills, and it is suggested that a Workforce Development Committee (WDC) be established to address these gaps. The WDC would support curriculum development, monitor evolving industry skill sets, and develop sustainable freight educational pathways. Proposed actions include convening leaders, creating modules and certifications, and collaborating with industry and education for targeted courses.

Additionally, Sustainable Freight Strategy recommends that SANDAG, ICTC, or other appropriate agencies create a data dashboard. Such a tool would aim to display the demand for skills and existing training options and visualize gaps to aid in program development.

Furthermore, the Sustainable Freight Strategy suggests instituting an employer-focused program, which involves educating employers on alternative hiring approaches, such as hiring non-traditional employees and providing in-house training for emerging skills.

2. INTRODUCTION

2.1 Project Overview & Vision

The freight industry is a critical intersection of economic growth, environmental stewardship, and community well-being. In adopting sustainable freight strategies, the San Diego and Imperial counties region intends to see reductions in greenhouse gas emissions to align with the region and State's climate action goals. The region's freight network carries a pivotal role in its sustainability trajectory, and adherence to new best practices and strategies can significantly alleviate impacts while improving the system. The adoption and implementation of sustainable strategies will bolster the resilience of the transportation networks while mitigating environmental impacts, enhancing air quality, and fostering long-term economic viability. This Sustainable Freight Strategy report serves as a comprehensive blueprint, navigating the intricate landscape of freight logistics to forge a path towards a more sustainable and resilient future for San Diego and Imperial Counties. Through strategic planning and collaborative efforts, public agencies can harmonize the movement of goods with the preservation of environmental standards and the well-being of communities.

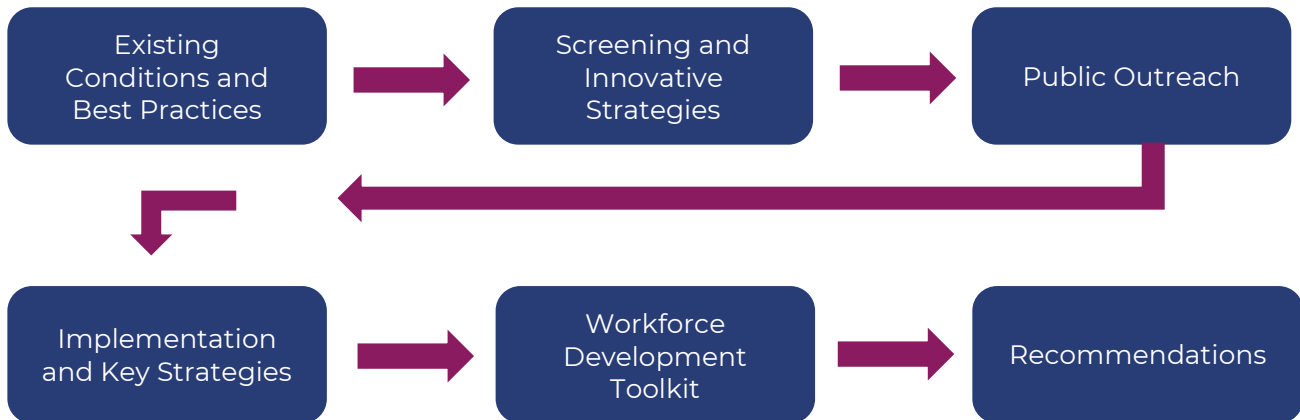
To achieve a more sustainable supply chain network within the San Diego and Imperial Counties region, this report outlines specific strategic objectives:

- Fostering partnerships among stakeholders, promoting collaboration that transcends organizational boundaries to achieve shared sustainability goals
- Addressing environmental justice and ensuring that the benefits of sustainable freight strategies are equitably distributed across communities
- Embracing innovative technology and leveraging cutting-edge solutions to optimize freight operations while minimizing environmental impact
- Securing funding mechanisms to support the implementation of sustainable projects
- Acknowledging and addressing workforce gaps, ensuring that the transition to a sustainable supply chain is accompanied by developing a skilled and resilient workforce capable of navigating the challenges and opportunities presented by these transformative initiatives

In pursuing these objectives, the San Diego and Imperial Counties freight network can serve as a forward-thinking model for regions across the state.

2.2 Report Outline and Summary

The structure of this report is designed to guide stakeholders through the current freight landscape and examine the proposed sustainable interventions. This structured approach ensures a holistic and informed strategy for sustainable freight implementation.



The report is designed to guide the reader through the various stages of the planning process and are outlined as follows:

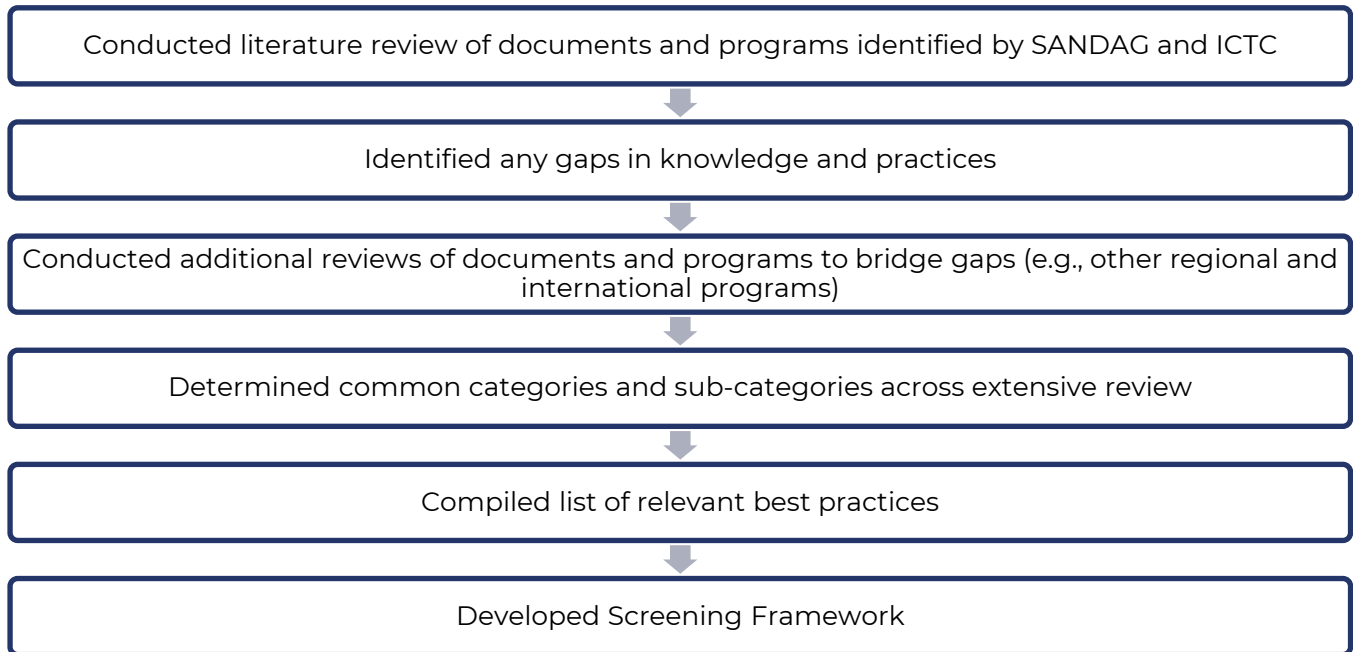
- An exploration of existing conditions and best practices, analyzing the present state of the freight network and highlighting successful examples from similar contexts.
- Screening innovative strategies, creating an assessment framework to identify and prioritize sustainable interventions.
- Incorporating public outreach with an emphasis on community engagement and diverse perspectives to ensure the strategies align with the needs and aspirations of the residents.
- Evaluation of strategies that employ robust metrics and benchmarks to gauge the effectiveness of proposed interventions.
- Best practices for implementation and the selection of the most promising key strategies for the execution of the Sustainable Freight Strategy.
- Comprehensive Workforce Development Toolkit, designed to empower the local workforce with the skills and knowledge required to navigate the evolving landscape of sustainable freight practices.
- Conclusive recommendations that synthesize the findings and propose actionable steps to guide stakeholders in realizing a sustainable and efficient freight network in San Diego and Imperial Counties.

3. EXISTING CONDITIONS AND BEST PRACTICES

The Sustainable Freight Strategy Existing Conditions Assessment (Existing Conditions) documents existing and upcoming sustainable trends, case studies, and pilots in the freight sector. The assessment includes a summary of relevant state, regional, and local plans; a review of best practices in sustainable freight; and a proposed screening framework for use in evaluating projects and policies for inclusion in the implementation strategy.

An extensive literature review and analysis of best practices within the current realm of sustainable freight projects and policies was conducted. Documents, reports, and industry newsletters were screened and reviewed to identify existing and upcoming sustainable trends, case studies, and pilots in the freight sector. While focusing on best practices and examples relevant to the study area in the region and the state of California, the team also reviewed various reports from other jurisdictions within the United States and Europe. The team then followed a process to screen for and determine best practices suitable for the Sustainable Freight Strategy (Figure 1).

Figure 1: Existing Conditions Assessment Process



Based on more than 30 studies and reports, the team identified three key categories of sustainable freight best practices and 17 specific strategies. Categories include 1) Technology Solutions, 2) Fleet Management and Operational Solutions, and 3) Infrastructure Improvements.

After identifying a set of best practices, a screening framework was developed to assess existing practices (Section 3.3). This screening framework was used to determine which existing projects, programs, and policies are in alignment with the vision statement and will meet the regional needs and priorities.

The Sustainable Freight Strategy Existing Conditions findings are outlined below and discussed in greater detail in APPENDIX A.

3.1 Existing Plans and Studies

A review of existing state, regional, and local plans and studies was conducted as part of the Sustainable Freight Strategy Existing Conditions. APPENDIX A contains a matrix summarizing each of the following documents:

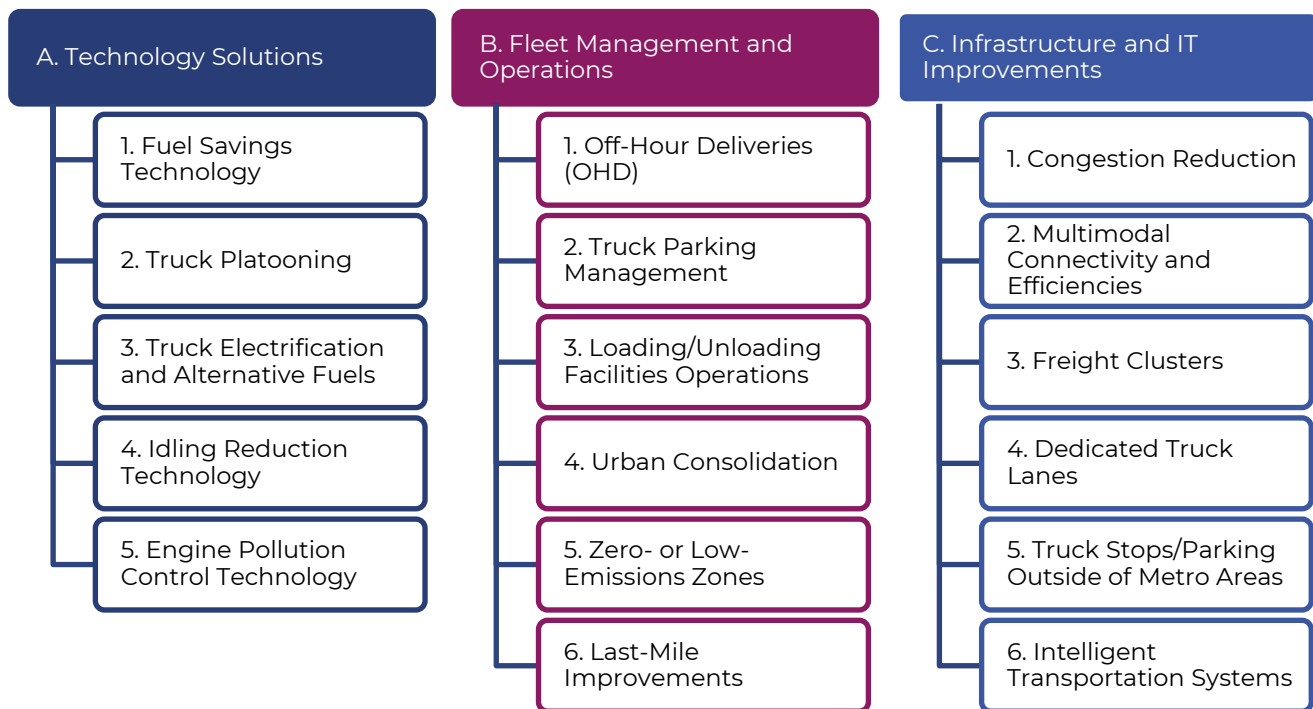
- Freight Efficiency Strategies: A White Paper Series to Inform the California Sustainable Freight Action Plan (2016)
- Methods for State DOTs to Reduce GHG Emissions from the Transportation Sector (2022)
- Freight Industry Issues & Trends Memo: Mid-South Freight Flows & Industry Analysis - Memphis Issues and Trends Report (April 2022)
- American Transportation Research Institute Trucking Research
- Sustainability Intervention Mechanisms for Managing Road Freight Transport Externalities: A Systemic Literature Review (2018)
- Sustainable Freight Transport, MDPI (2021)
- 2040 Portland Freight Plan – Freight Greenhouse Gas Reduction Best Practices (2022)
- Guide to Deploying Clean Truck Freight Strategies (2017), National Cooperative Highway Research Program
- Understanding the CO2 Impacts of Zero-Emissions Trucks: A Comparative Life-Cycle Analysis of Battery Electric, Hydrogen Fuel Cell and Traditional Diesel Trucks (May 2022). American Transportation Research Institute
- National Academies of Sciences, Engineering, and Medicine 2020. Reducing Fuel Consumption and Greenhouse Gas Emissions of Medium-and Heavy-Duty Vehicles, Phase Two: Final Report (2020)
- Deployment of Green Best Practices in Supply Chain Processes (2020)
- State of Art and Practice of Urban Freight Management: Part I: Infrastructure, vehicle-related, and traffic operations (2018)
- State of the art and practice of urban freight management: Part II: Financial approaches, logistics, and demand management (2018)
- City of Toronto Freight and Goods Movement Strategy Literature Review (2019)

- The Greening of Logistics: Cutting Pollution and Greenhouse Gas Emissions (Global Logistics and Supply Chain Management, 8th Edition (2021)
- California Sustainable Freight Action Plan (2016)
- California Division of Research, Innovation and System Information Research Reports
- SANDAG 2021 Regional Plan
- Community Emission Reduction Plan – Portside Environmental Justice Neighborhoods (2021)
- Southern California Association of Governments Curb Space Management Study (2022)
- California Statewide Truck Parking Study (2022)

3.2 Best Practices

A review of state, national, and international best practices in sustainable freight was conducted. The results have been organized into three key categories and 17 strategies relevant to the SANDAG and ICTC study area (Figure 2). More information about each strategy can be found in APPENDIX A.

Figure 2: Best Practices - Categories and Strategies



3.3 Screening Framework

The screening framework to assess existing practices was developed after conducting literature reviews and best practices analysis. The screening framework is intended to help identify existing projects, programs, and policies in alignment with the project vision statement that can help meet regional needs and priorities. The screening framework consists of the evaluation and scoring of both benefits and feasibility in relation to freight sustainability goals. The scoring of benefits and scoring of feasibility criteria, scoring, and weighting can be seen in Table 1 and Table 2 below.

Table 1: Scoring of Benefits

Areas	Criteria	Scoring	Weighting
Environment	Impact on reducing emissions of GHGs	1 - 3	35%
	Impact on reducing emissions of criteria pollutants (particulate matter, NO _x , VOC, etc.)	1 - 3	
Equity	Degree to which benefits accrue to most vulnerable communities (Top 25% of CalEnviroScreen 4.0 scores, or AB 617), and vulnerable communities (Top 50% of CalEnviroScreen 4.0 scores, or Tribal Land), including safety considerations	1 - 3	35%
Economy	Improves efficiency (speeds and reliability) of freight transportation system	1 - 3	30%
	Improves capacity of freight system to accommodate expected increases in freight	1 - 3	

Table 2: Scoring of Feasibility

Areas	Criteria	Scoring	Weighting
Costs	Approximate implementation costs	1 - 3*	35%
Funding	Availability of funding	1 - 3	25%
Stakeholder Support	Support for implementation from stakeholders and legislative bodies	1 - 3	15%
Technological Complexity	Readiness of the required technology, including testing, development, and regulatory compliance	1 - 3	15%
Planning Continuity	Consistent with local or regional plans or programs and/or in alignment with other transportation modes	1 - 3	10%

*Cost scoring will be such that low-cost strategies are assigned a high score and high-cost strategies will receive a low score.

The screening framework is guided by following the purpose and need of this project:

- The region is critical to state, national, and international economies

- Freight is an economic engine, but produces greenhouse gas emissions
- The State prioritizes transition of the freight sector to sustainable technologies
- Environmental health burdens that disproportionately impact vulnerable communities and tribal governments should be minimized
- State and regional plans have highlighted the need for a regional sustainable freight vision
- Multimodal project and policy implementation is needed

The successful implementation of freight sustainability projects and policies requires a life-cycle approach that centers knowledge of system operations, the constraints of stakeholders, possibilities and limitations of technologies, and a ground-level understanding of community impacts. Figure 3 describes some of the steps that help develop this understanding and implement projects or strategies that work in the real world and achieve sustainability objectives.

Figure 3: Sustainability Implementation Steps



4. INNOVATIVE STRATEGIES SCREENING

This section provides an overview of existing freight-related projects and project types in the regional plans within the study area. It describes how different types of projects score under the Screening Framework developed as part of Section 3.. Additionally, the innovative strategies addressed have been further expanded and analyzed to provide strategies to both improve projects in existing regional plans and to augment those plans with new sustainable freight initiatives.

4.1 Assessment of Existing Freight Projects

Figure 4 summarizes the anticipated performance of various types of projects in current regional plans against the screening criteria. The project types and their characteristics are described in this section.

Figure 4: Summary of Existing Projects in the Screening Framework

Types of Existing Projects	Proposed Screening Framework		
	Equity	Environment	Economic
Complete Corridor	Moderately favorable	Moderately favorable	Moderately favorable
Marine Terminals	More favorable	More favorable	More favorable
Port of Entry Projects	More favorable	More favorable	More favorable
Truck Parking	Moderately favorable	More favorable	More favorable
Rail Projects	Less favorable	More favorable	More favorable
Grade Separation	More favorable	More favorable	Moderately favorable
Airport Projects	Moderately favorable	Moderately favorable	More favorable

4.1.1 Complete Corridor and Highway Projects

Complete Corridors prioritize various travel modes and leverage technology for real-time road management. These corridors aim for a balanced, dedicated, and safe space for freight vehicles, pedestrians, cyclists, drivers, transit riders, and flexible fleets. Projects include managed lanes, alternative fuel corridor enhancements, truck climbing lanes, and freight signal prioritization. Freight-related complete corridor projects in the region align

with the freight sustainability framework, focusing on improving traffic fluidity, reducing negative externalities, and enhancing system capacity.

The California Transportation Commission, under Senate Bill (SB) 671, is developing a Clean Freight Corridor Efficiency Assessment. Identified priority corridors for zero-emission infrastructure include the following:

- Interstate (I-) 5, I-805, State Route (SR) 905, and SR 11 between the Orange County/San Diego County line and the Otay Mesa and future Otay Mesa East Ports of Entry (POEs)
- I-15 between the Riverside County/Orange County line and I-5 in San Diego
- I-8 between I-5 in San Diego and the California/Arizona line
- SR 86, SR 78, SR 111, and SR 7 between the Riverside County/Imperial County line and the Calexico East POE.

4.1.2 *Marine Terminal Projects*

The Port of San Diego leads the regions' working waterfront and facilitates the international and domestic movement of goods and people. The Port, comprising the Tenth Avenue Marine Terminal and the National City Marine Terminal, is planning improvements aligned with sustainability goals. These enhancements aim to boost connectivity between water and rail infrastructure, diminishing reliance on trucks for freight transportation. The projects include electrification of freight infrastructure, adoption of zero- or near-zero-emission vehicles, and installation of shore power systems to reduce vessel emissions while at berth. Reduction in externalities from truck traffic serves to advance equity and environmental justice efforts, as the Port is situated near highly vulnerable communities. Environmentally, marine projects promise to reduce greenhouse gas and air pollutant emissions by leveraging technologies like idling reduction systems. The Port's Maritime Clean Air Strategy sets ambitious emission reduction goals, aiming for 100% zero-emission cargo trucks and handling equipment by 2030, focusing on charging infrastructure investments near the marine terminals to accelerate progress.

4.1.3 *Port of Entry Projects*

Planned POE projects, including the construction of the Otay Mesa East POE in San Diego County and the expansion of the Calexico East POE in Imperial County, are designed to enhance cross-border commercial vehicle traffic efficiency and capacity. Associated improvements to nearby truck routes, such as Menvielle Road and SR 7, are expected to support these objectives. Companion development of zero-emission charging/refueling stations in the vicinity will support cross-border drayage operations. Situated in and around vulnerable communities, these projects aim to improve the freight transportation system's efficiency, reducing delays and emissions. From an environmental standpoint, the projects

could score favorably by adopting fuel technology improvements, idling reduction technologies, and operational efficiency practices to reduce greenhouse gas and air pollutant emissions. Additionally, the projects are likely to enhance economic competitiveness by improving POE operational efficiency, benefiting operations and logistics.

4.1.4 Truck Parking Projects

Truck parking projects aim to modernize existing areas with near-zero and zero-emission infrastructure for truck plug-ins, particularly along intercity freight corridors and near marine ports, including key commercial vehicle POEs such as Otay Mesa in San Diego County and Calexico East in Imperial County. Positioned away from residential areas, these projects mitigate localized impacts while meeting truck driver needs and minimizing out-of-direction travel. They score favorably in the sustainability framework by facilitating truck fleet electrification and enhancing freight sector fluidity. From an equity standpoint, projects in vulnerable communities are likely to score favorably by reducing emission impacts. While adding new truck parking spaces could address undesignated parking issues, each project should be evaluated case by case, considering local impacts. Environmentally, focusing on zero-emissions and renewable energy fuel options enhances project scores. Lastly, from an economic perspective, increasing and modernizing truck parking facilities could enhance competitiveness and economic opportunities.

4.1.5 Rail Projects

With rail technology being up to ten times more fuel-efficient per ton moved compared to trucking, rail transportation projects play a crucial role in enhancing sustainability by shifting freight from trucks to a more efficient mode. While rail offers general air quality benefits, localized pollution from rail switching operations can pose health risks, warranting consideration of hybrid or zero-emission technologies. SANDAG's plan to double-track the Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor and other proposed rail projects, including improvements to the Tijuana-Tecate Interurban Rail Line and the Desert Line, aim to increase freight rail capacity and operational efficiency. From an equity standpoint, the impact on vulnerable communities and safety concerns near at-grade crossings should be considered. Passenger services along the LOSSAN corridor benefit from these improvements, contributing to reductions in pollution and greenhouse gas emissions through a shift in passenger transportation modes. From an economic and competitiveness perspective, improved rail infrastructure offers choices to shippers, increases efficiency, and may provide opportunities for industrial businesses to use new or expanded rail spurs, requiring further study for evaluation.

4.1.6 *Grade Separation Projects*

Grade separation projects under consideration in Imperial County are focused near Calexico, El Centro, and Brawley. In San Diego County, the projects primarily target the LOSSAN corridor and the South Line between Downtown San Diego and San Ysidro. These projects offer benefits for both freight and passenger travel, reducing delays and crash risks. Future analyses should explicitly include truck volumes and delays at crossings, as prioritizing projects based on high traffic volume, frequent train crossings, and slower train speeds will be most effective. Grade separation projects can significantly reduce emissions from idling trucks and general traffic, particularly where train frequency and roadway volumes are high. From an equity standpoint, these projects in vulnerable communities enhance safety conditions, encourage active transportation, and reduce harmful emissions. Lastly, from an economic perspective, improved grade separations on trade routes reduce congestion, enhancing overall competitiveness by improving on-time performance critical for modern supply chains. Where grade separations are not feasible, advanced train detection systems can mitigate the impact of long trains and delays at at-grade crossings.

4.1.7 *Airport Projects*

Projects enhancing roadway accessibility to airports could score moderately favorably under the freight sustainability framework. From an economic perspective, airport projects are likely to score favorably as they improve reliability in accessing airports, benefiting high-value goods and industries reliant on air cargo services. However, from an equity standpoint, the impact is unclear because vulnerable communities may not directly benefit. Improved nearby roadways and cargo facilities may increase efficiency and reduce idling, but the volume of trucks and associated emissions is expected to be minor. Limited options exist for improving sustainability in airport projects due to their relatively small number of trucks. Fleet electrification for trucks carrying goods within the region to the airport may be explored, considering smaller sizes and shorter distances. Lastly, while air freight has greenhouse gas impacts, modal diversion opportunities are limited, and sustainability efforts rely on international private sector research and development beyond the study's scope.

4.2 Strategies and Pilot Projects Assessment

This section outlines potential innovations for sustainable freight practices in three key categories:

- Technology Solutions
- Fleet Management and Operational Solutions
- Infrastructure Improvements

These strategies contribute to equity, environment, and economy in freight sustainability. An overview of these strategies can be found below, and more detailed information can be found in APPENDIX C.

4.2.1 Technology Solutions

Transformative technological solutions are steering the course for a resilient, sustainable, and efficient freight ecosystem. Some examples of these technologies include:

- Zero-Emission technology and electric charging
- Off-street truck parking strategies and commercial vehicle appointment window systems
- Truck platooning and connected and autonomous vehicles
- Radio-frequency integrated circuit and real-time travel information

At the forefront of an industry shift towards cleaner and more efficient freight practices are pivotal initiatives driving the advancement of zero-emission technology. Exemplified by innovative pilot projects such as the hybrid hydrogen fuel cell and battery systems on passenger lines (e.g., Metrolink Arrow). The prospect of establishing a zero-emission locomotive fueling hub at the upcoming Pacific Surfliner maintenance facility in San Diego further underscores the commitment to environmentally conscious rail operations. Beyond rail advancements, there is a promising evolution of electric charging technology, with projects like the San Diego Regional Medium- and Heavy-Duty Zero-Emission Vehicle Blueprint. From truck electrification to commercial vehicle appointment window systems and cutting-edge technologies like truck platooning and Connected and Autonomous Vehicles, the industry embraces innovation for a sustainable future. SANDAG's NextGen 511 Concept of Operations is poised to revolutionize real-time travel information communications, aligning seamlessly with best practices to enhance safety notifications for truck drivers.

4.2.2 Fleet Management and Operations

Fleet management and operations strategies focus on the comprehensive oversight and coordination of commercial vehicle fleets and their activities to promote more sustainable operations. Fleet and operational management can reshape the landscape of sustainable freight practices through the implementation of an innovative and diverse set of strategies focused on minimizing emissions and energy consumption throughout the transportation process. The potential innovations to fleet management and operations include the following strategies:

- Toll discounts
- Freight georeferencing
- Off-peak pick-up and delivery programs

- Urban consolidation and mobility hubs
- Delivery lockers
- Cargo bikes
- Delivery robots
- Crowd-sourced deliveries
- Low-Emission Zone (LEZ)
- Advanced Air Mobility (AAM)

4.2.3 *Infrastructure Improvements*

The advancement of sustainable infrastructure improvements and enhancements is crucial to the foundation of a sustainable freight network and can be spearheaded by public agencies. Several strategies that provide benefits to the freight network and ensure the enduring viability of sustainable freight routes are outlined below:

- Intelligent Transportation Systems
- Active Transportation and Demand Management
- Dedicated truck lanes & expansion of managed lanes
- Freight signal priority
- Truck operations in work zone
- Freight clusters & intermodal facilities

Initiatives such as the Regional Border Management System under the Advancing Border Connectivity project showcase the integration of Intelligent Transportation Systems to streamline border crossing and optimize goods movement. The application of Active Transportation and Demand Management technology, highlighted in SANDAG's Advancing Border Connectivity project, further underscores the commitment to real-time adaptability, enhancing safety and efficiency for trucks on existing roads. The exploration of dedicated truck lanes with innovative projects such as Harbor Drive 2.0 and pilot programs for managed lane access, contribute to a comprehensive strategy for improving freight operations. Additionally, the focus on freight clusters and the establishment of zero-emissions in land ports exemplify a forward-thinking approach to achieving sustainability and efficiency in goods movement.

5. PUBLIC OUTREACH PLAN

This section describes the public outreach, stakeholder coordination, and community engagement relevant to developing the Sustainable Freight Strategy. A detailed outline of the Public Outreach Plan can be found in APPENDIX D.

5.1 Outreach Goals

Strategies identified through the Existing Conditions and Best Practices analysis (Section 3) and the Innovative Strategies Screening (Section 4) were paired with feedback from the public and stakeholders to develop the framework for how existing and new sustainable freight projects, programs, and policies would advance in the region.

The goals for the outreach plan included the following:

- Spark honest conversations about community impacts of freight and find a way forward for sustainable freight movement
- Maximize broad and representative participation in the study. This was accomplished by using an integrated approach beginning with stakeholders most familiar with the issues and working outward to engage the general population
- Ensure all communities have a voice, including historically marginalized communities that typically are not involved in transportation planning initiatives. The team made special efforts to work with organizations and individuals trusted by these communities.

5.2 Stakeholder Interviews

Stakeholder interviews were conducted early in the project to understand the broader contextual issues in which the Sustainable Freight Strategy is being developed. The details from these interviews can be found in APPENDIX E and a summary of major themes below:

- The growth of freight movement, particularly trucking, and its impact on the environment.
- The impact of traffic congestion on freight movement and emissions.
- Potential benefits of shifting some freight from truck to rail.
- Concerns about the lack of electric charging infrastructure and the need for coordination of charging infrastructure across borders.
- Interest in other sustainable fuels such as hydrogen.
- Challenges for the trucking industry to absorb the cost of electric vehicle equipment and the time for charging.

- The need for more financial incentives for the freight industry in order to achieve sustainability goals.

5.3 Focus Groups

Four focus groups were held in January 2023 to gain input on existing and proposed strategies addressing equity, workforce development issues, and improving economic competitiveness. A summary of the input from the four focus groups can be found in APPENDIX F, and a general summary of some of the main points are listed below.

Community Involvement and Education:

- Importance of educating communities and allowing their input in strategy implementation.
- Community members can identify hidden impacts of freight strategies.

Sustainable Energy Jobs:

- Need for creating sustainable energy jobs in communities affected by freight emissions for economic stimulation and equity.

Idling Reduction Technology:

- Urgent implementation is needed, especially near sensitive areas like schools.

Alternative Fuels:

- Biofuel and hydrogen fuel are not considered beneficial due to negative environmental and health impacts.

Last Mile Improvements and Urban Consolidation:

- Importance acknowledged but concerns about suggested pilot locations without alternatives.

Truck Parking:

- Proposal for rooftop solar panels on truck parking facilities.
- Suggestion to utilize existing seasonal parking areas for trucks.

Involving Youth:

- Vital to educate and involve youth in sustainability strategies for future career paths and increased public engagement.

Rail Projects:

- Expansion of rail systems seen as beneficial for both freight and passenger transport.

Technology and Infrastructure Challenges:

- Need for infrastructure improvements, including charging stations and truck parking.
- Implementation challenges due to lack of resources and staffing.

Workforce Development and Training:

- Funding and training needed for emerging industries, with a focus on high school education and workforce demand research.

Community Outreach and Engagement:

- Importance of informing communities about emerging industries and job opportunities.

Zero Emissions Technology:

- Need flexibility in compliance with zero emissions standards, considering feasibility for heavy haulers.

Idling Reduction and Off-Hours Deliveries:

- Lack of zero emissions facilities and potential barriers to off-hours deliveries.

Challenges in Trucking Industry:

- Shortage of trucks and drivers, requiring solutions before implementation.

Communication and Collaboration:

- Importance of involving manufacturers and truckers in sustainable freight strategy discussions.

5.4 Technical Advisory Committee

SANDAG's Freight Stakeholders Taskforce (FSTF) was engaged as the primary advisory committee throughout the project. The FSTF is composed of public and private freight stakeholders, including entities responsible for freight planning and freight project development, resource agencies, transportation agencies, and industry representatives. The FSTF provided input on all major project deliverables during the project. Some of the feedback and comments that were received throughout the project are outlined below:

- Frequent complaints at the community planning group meetings that truck traffic and noise in the evenings
- Hydrogen fueling facilities will likely require sites that have no seismic issues. There are other restrictions related to proximity to sensitive receptors that may limit the number of sites near the Port that can be used for this purpose
- Include a feedback mechanism to hear from small trucking company operators, such as the OOIDA: Owner-Operator Independent Drivers Association
- Consider small businesses in the sustainable freight vision statement
- Safety is a priority to be considered under "environment" in the screening framework
- Safety benefits for disadvantaged communities is important when proposing additional lanes or truck parking to alleviate congestion in DACs
- Small business truckers who are members of the DACs should be especially considered for inclusion in the equity category
- Innovative technologies should be considered based on their readiness for application. Avoid penalizing the use of new technology. Also, consider regulatory barriers as an impediment
- Consider the spirit of sustainability goals in evaluation beyond numerical criteria
- Most important projects can be the most complex. Competing stakeholders and inter-jurisdictional coordination can be an impediment to implementation
- Caltrans Freight Planning recently completed the California Statewide Truck Parking Study that included related analysis and recommendations. We recommend that SANDAG include the study as part of the literature review section of the Existing Conditions and Sustainable Freight Best Practices report
- One of the top priorities for projects in the region should focus on zero-emission truck charging and parking facilities. This is directly followed by upgrading rest area parking and amenities. The second priority is upgrading rest area parking and amenities. The implementation of truck-only lanes is the third most important project type
- The top program priority is private truck parking development. Dynamic curb regulation is the second most important priority with cargo bike incentives following
- Policy priorities are overweight truck route planning and low-emissions zones with land use compatibility recommendations following

5.5 Standing Committees

Outreach efforts included presentations to the following standing committees:

SANDAG:

- Borders Committee
- Transportation Committee
- Interagency Technical Working Group on Tribal Transportation Issues
- Committee on Binational Regional Opportunities

The SANDAG Transportation Committee provided feedback during the presentation of the Sustainable Freight Strategy at their meeting on February 16, 2024. The comments revolved around an approach to incorporate zero-emission technology and facilities across the network. There was notable interest in the importance of addressing pollution and reducing emissions and greenhouse gases. Additionally, the significance of workforce development for creating quality jobs and fostering economic prosperity was highlighted. The overall enhancement of community well-being, with a focus on improvements in health, safety, and neighborhood planning was also a focus of the discussion. There was consensus in the appreciation for the Sustainable Freight Strategy and interest in moving forward with implementation.

External:

- Imperial-Mexicali Binational Alliance
- AB 617 - International Border Community Steering Committee
- AB 617 - Portside Community Steering Committee
- AB 617 - Calexico, El Centro, Heber Community Steering Committee
- Tijuana-San Diego Air Quality Task Force

5.6 Public Survey Summary

A survey was conducted to obtain community input regarding freight issues and gauge preferences and priorities toward multimodal improvements under consideration in the Sustainable Freight Strategy. The survey was promoted on SANDAG and ICTC social media sites, and the team made dedicated efforts to engage Community Based Organizations (CBOs) for assistance with outreach. The survey platform was established using MetroQuest, a company specializing in online public engagement for urban and transportation projects.

A total of 165 individuals participated in the survey that was open to the public between March 18, 2023, and April 27, 2023, available online and in paper. When prompted to answer

how freight transportation affects their community, respondents outlined the following key areas:

- Noise (31 mentions)
- Traffic (25 mentions)
- Air Quality (28 mentions)
- Parking (22 mentions)

Included in the responses are the following potential improvements:

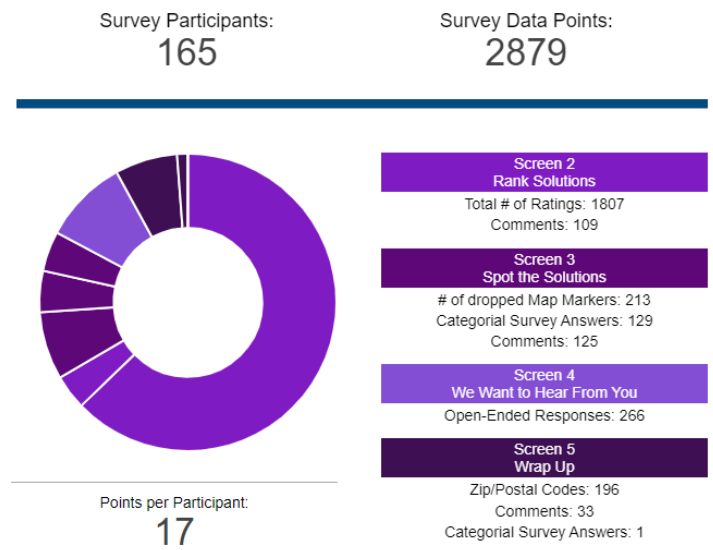
- Reduce/Limit Truck Movement Zones and Times (21 comments)
- Electric vehicles (9 mentions)
- Add Rail & Rail Infrastructure (7 comments)
- More trucking infrastructure - e.g., wider roads, added off-ramp, freeway-cap (5 comments)

Additionally, the survey participants were asked to rate potential solutions to improve freight movement in the region. Out of a total of 14 strategies, the highest-ranked solutions include:

- Clean up Port operations
- Grade separations
- Truck Parking/fueling outside cities
- Zero- and low-emission areas

A snapshot of the total survey responses and responses by survey screen can be seen in Figure 5 below. The complete summary can be viewed in APPENDIX E.

Figure 5: Snapshot of the total survey responses



6. STRATEGY EVALUATION

Building on the evaluation criteria developed for the Existing Conditions and Best Practices and Innovative Strategies screening, this section documents the methodology and assumptions made to evaluate and establish the feasibility of each strategy. Each strategy was evaluated according to anticipated benefit and feasibility criteria outlined in Section 3, Existing Conditions and Best Practices. The criteria are described in Table 3 and Table 4. A complete scoring matrix can be found in APPENDIX G.

Table 3: Scoring of Benefits

Areas	Criteria	Scoring	Weighting
Environment	Impact on reducing emissions of greenhouse gases	1 - 3	35%
	Impact on reducing emissions of criteria pollutants (particulate matter, NO _x , VOC, etc.)	1 - 3	
Equity	Degree to which benefits accrue to most vulnerable communities (Top 25% of CalEnviroScreen 4.0 scores, or AB 617), and vulnerable communities (Top 50% of CalEnviroScreen 4.0 scores, or Tribal Land), including safety considerations	1 - 3	35%
Economy	Improves efficiency (speeds and reliability) of freight transportation system	1 - 3	30%
	Improves capacity of freight system to accommodate expected increases in freight	1 - 3	

Table 4: Scoring of Feasibility

Areas	Criteria	Scoring	Weighting
Costs	Approximate implementation costs	1 - 3*	35%
Funding	Availability of funding	1 - 3	25%
Stakeholder Support	Support for implementation from stakeholders and legislative bodies	1 - 3	15%
Technological Complexity	Readiness of the required technology, including testing, development, and regulatory compliance	1 - 3	15%
Planning Continuity	Consistent with local or regional plans or programs and/or in alignment with other transportation modes	1 - 3	10%

*Costs scoring will be such that low-cost strategies are assigned a high score and high-cost strategies will receive a low score.

A baseline score was determined for each project type, and scoring was then adjusted according to the location of the proposed project and other contextual details. Proposed policies and programs not defined by geographic locations were evaluated based on documented implementation outcomes in other cities, if available, and the best available information. Scores may change as more information is gathered and strategies are further defined in advance of implementation.

The project team performed a comprehensive assessment, consisting of the evaluation and scoring of the benefits and feasibility of each strategy, that resulted in the creation of an interactive matrix. Planners can use this matrix to sort and filter through the various strategies and provide updates to scores in response to changing conditions. For example, new funding programs or technological improvements could elevate strategies that may not currently rise to the top of the priority list. Figure 6 shows a screenshot of the evaluation matrix.

Figure 6: Strategy Evaluation Scoring Matrix Example Screenshot

Corridor	County	Start	End	Project Description	Project Type	Scoring of Benefits				Scoring of Feasibility					
						Environment	Equity	Economy	Benefits Weighted	Cost	Funding	S. Support	Tech Complexity	Planning Cont.	Opportunities/ Feasibility Weighted
Harbor Drive	SD	National City Marine Terminal		NCMT Truck Parking/ Staging - Truck parking and staging alternatives for NCMT, including but not limited to EV charging infrastructure	Marine, Truck Parking, ZEV	3	3	3	3	1	3	3	2	3	2.55
I-8	SD	Greenfield Dr	Forrester Rd	Golden Acorn Casino & Travel Center: Expand truck parking, add amenities, ZE charging, onsite electric generation and storage. Supports I-ZEV & Alternative Fuel Corridor	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
I-8	SD	Greenfield Dr	Forrester Rd	Buckman Springs Safety Roadside Rest Area: Expand truck parking, add amenities, ZE charging, onsite electric generation and storage. Supports I-ZEV & Alternative Fuel Corridor	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
I-8	IC	Greenfield Dr	Forrester Rd	Sunbeam Safety Roadside Rest Area: Expand truck parking, add amenities, ZE charging, onsite electric generation and storage. Supports I-ZEV & Alternative Fuel Corridor	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
I-8	IC	SR 7	State Line	Sand Hills Safety Roadside Rest Area: Expand truck parking, add amenities, ZE charging, onsite electric generation and storage. Supports I-ZEV & Alternative Fuel Corridor	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
SR 7	IC	International Border	SR 98	Calexico East POE/Gateway of the Americas Specific Plan Area: Support for private development of ZE truck charging/parking/staging	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
SR 78	IC	SR 115	Riverside County line near Palo Verde	ZE infrastructure/truck parking/staging to support SR 78 Alternative Fuel Corridor	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
SR 86	IC	SR 78 S	SR 78 N	Support for private ZE infrastructure/truck parking/staging. Add ZE charging to existing Love's Travel Stop in Westmorland	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
SR 188	SD	International Border	SR 98	Tecate POE: Border Wait Times - Install the remaining border wait times equipment (northbound) at all CA-BC land POEs, and Regional Border Management System	POE, ITS	3	3	3	3	1	2	3	3	3	2.75
SR 905	SD	SR 11	International Border	Otay Mesa POE: Border Wait Times and Regional Border Management System	POE, ITS	3	3	3	3	1	2	3	3	3	2.75
SR 11	SD	SR 125	International Border	Otay Mesa East POE: ZE truck charging/parking/staging	POE, ZEV, Truck Parking	3	3	3	3	1	3	3	1	3	2.7
SR 11	SD	SR 125	International Border	Otay Mesa East POE: wireless electric charging for trucks in queue	POE, ZEV	3	3	3	3	1	3	3	1	3	2.7
SR 188	SD	International Border	SR 98	Tecate POE: wireless electric charging for trucks in queue	POE, ZEV	3	3	3	3	1	3	3	1	3	2.7
SR 7	IC	International Border	SR 98	Calexico East POE: wireless electric charging for trucks in queue	POE, ZEV	3	3	3	3	1	3	3	1	3	2.7
SR 905	SD	SR 11	International Border	Otay Mesa POE: ZE truck charging/parking/staging	POE, ZEV, Truck Parking	3	3	3	3	1	3	3	1	3	2.7
SR 905	SD	SR 11	International Border	Otay Mesa POE: wireless electric charging for trucks in queue	POE, ZEV	3	3	3	3	1	3	3	1	3	2.7
SR 11	SD	SR 125	International Border	Otay Mesa East POE: Preclearance to accelerate processing time for trucks in coordination with other agencies/law enforcement per Border Master Plan white paper	POE	3	3	3	3	1	2	3	2	3	2.6
SR 188	SD	International Border	SR 98	Tecate POE: commercial vehicle appointment window system	POE, ITS	3	3	3	3	1	2	3	2	3	2.6
SR 188	SD	International Border	SR 98	Tecate POE: Preclearance to accelerate processing time for trucks in coordination with other agencies/law enforcement per Border Master Plan white paper	POE	3	3	3	3	1	2	3	2	3	2.6
SR 7	IC	International Border	SR 98	Calexico East POE: commercial vehicle appointment window system	POE, ITS	3	3	3	3	1	2	3	2	3	2.6
SR 905	SD	SR 11	International Border	Otay Mesa POE: commercial vehicle appointment window system	POE, ITS	3	3	3	3	1	2	3	2	3	2.6
SR 905	SD	SR 11	International Border	Otay Mesa POE: Preclearance to accelerate processing time for trucks in coordination with other agencies/law enforcement per Border Master Plan white paper	POE	3	3	3	3	1	2	3	2	3	2.6
Harbor Drive	SD	Tenth Avenue Marine Terminal		Tenth Avenue Marine Terminal Redevelopment Plan: Enhanced electrical and infrastructure/equipment and enhanced and additional on-dock rail	Marine, Rail	3	3	3	3	2	3	3	3	2	2.55
SR 111	IC	SR 78	County Line	Two Rivers Safety Roadside Rest Area: Reopen, expand truck parking, add amenities, ZE charging, onsite electric generation and storage. This particular site may be infeasible to reopen in the near term, per Caltrans	Truck parking, ZEV	3	3	3	3	1	3	1	2	3	2.55

6.1 Scoring of Benefits

6.1.1 Environment

Environment scores for proposed strategies were determined based on the potential to reduce emissions of greenhouse gases and criteria pollutants based on a typical application of the project as currently defined. For example, a proposed project to provide zero-emissions charging/fueling infrastructure for trucks was given a baseline environment score of 3, given its potential to reduce emissions by supporting the transition of fossil fuel-powered trucks to zero-emission trucks. A proposed project with an uncertain net impact on emissions, such as changes to commercial port of entry (POE) processing technology, was given a baseline environment score of 2. A proposed project anticipated to increase emissions, such as a highway widening, was given a baseline environment score of 1.

6.1.2 Equity

Equity scores for proposed strategies were determined based on the degree to which benefits accrue to vulnerable communities. These communities were determined according to the top 25% (most vulnerable) and top 50% (vulnerable) of communities, as defined by CalEnviroScreen 4.0. CalEnviroScreen 4.0 is also used to evaluate equity in SANDAG's 2021 Regional Plan. The definitions of most vulnerable and vulnerable also include communities designated through the AB 617 Community Air Protection Program and tribal lands. Safety was also considered in this area of evaluation, with proposed strategies that improve safety resulting in higher scores.

A proposed project to provide zero-emissions charging/fueling infrastructure for trucks was given a baseline score of 3 for equity, given that reductions in emissions likely benefit vulnerable communities. If that zero-emissions charging/fueling infrastructure project were located close to sensitive land uses, its equity score was reduced to 2, as the project could attract more trucks than would otherwise be in that area. Converting existing trucks to zero-emissions would have a clear benefit to equity, but increasing the number of trucks in a vulnerable community could still contribute to noise and safety concerns from residents. A proposed project that would increase traffic speeds or volumes near most vulnerable and vulnerable communities would likely negatively impact those communities and be given a baseline score of 1.

6.1.3 Economy

Economy scores for proposed strategies were determined according to their potential to increase freight efficiency and capacity. Road widening, expansions of truck parking facilities, and technology to reduce truck delays are example strategies assumed to have a strong economic benefit and were given a baseline score of 3. Proposed strategies with an uncertain economic benefit, such as temporary truck climbing lanes that do not

significantly increase road capacity, were given a baseline score of 2. Proposed projects that would detour trucks around communities and increase the time or distance of travel would likely reduce freight efficiency and were assigned a baseline score of 1.

6.2 Scoring of Feasibility

6.2.1 Cost

The proposed strategy list contains many projects that are conceptual in nature and have not been developed enough to have detailed cost estimates. However, the cost of a project is a significant factor when considering feasibility of implementation. Costs developed for this evaluation are high-level and based on available information, such as similar implementation in other cities. Similarly, costs for different strategies may vary for both capital costs or operations and maintenance costs. High-level cost estimates were developed for all the strategies. The thresholds for high-, medium-, and low-cost strategies were then determined based on the distribution cost estimates. Approximately one-third of strategies were allocated to each scoring category. In general, strategies were considered low-cost and given a score of 1 if they cost up to \$10 million, considered medium-cost and given a score of 2 if they cost between \$10 and \$100 million, and considered high-cost and given a score of 3 if they cost greater than \$100 million to implement. These scores were used to avoid confusion. It should be noted that when determining overall weighted feasibility, the inverse scores were used in the calculation.

6.2.2 Funding Availability

SANDAG and ICTC monitor and evaluate numerous state and federal discretionary grant programs for their applicability to strategies that the agency is likely to pursue. Many of these programs are recurring, with new funding cycles being announced regularly. The project team assumed that these programs would continue to be available to fund proposed strategies. Grant program summaries were evaluated to determine at a high level if proposed strategies matched grant program eligibility requirements. If a strategy could be considered an eligible use of the funds according to the grant program summary, that was considered a match. Strategies with more matches were considered to have greater availability of discretionary funding than those strategies that had fewer matches. In total, over 100 grant programs were evaluated. Strategies with 10 or fewer matches were considered to have low availability of funding and received a score of 1; strategies with 11 to 20 matches were considered to have medium availability of funding and received a score of 2; and strategies with 21 or more matches were considered to have high availability of funding and received a score of 3. As with the cost criteria, these thresholds were determined to result in a distribution of scores such that approximately one-third of the strategies would fall into each scoring category.

6.2.3 Stakeholder Support

Stakeholder support for proposed strategies was determined based on the outreach conducted throughout the project. The project team conducted interviews, focus groups, presentations, and surveys with various stakeholders throughout San Diego and Imperial Counties. Qualitative feedback from the interviews and focus groups was evaluated in the context of proposed strategies, with dialogue supportive of a proposed strategy resulting in a score of 3, dialogue moderately supportive of a proposed strategy resulting in a score of 2, and dialogue unsupportive of a proposed strategy resulting in a score of 1. The online survey conducted in spring 2023 also asked respondents to rate their approval or disapproval of proposed projects. This quantitative feedback was used to determine scores.

Policies and programs were less emphasized in the online survey conducted in spring 2023. However, the project team conducted additional surveying during a presentation in July 2023 to the AB 617 Portside Community Steering Committee, a standing committee identified during the development of the Public Outreach Plan for project engagement. Quantitative and qualitative feedback from this presentation was used to score policies and programs, with supportive comments and scores resulting in a score of 3, moderately supportive comments and scores resulting in a score of 2, and unsupportive comments and scores resulting in a score of 1.

6.2.4 Technological Complexity

The technological complexity scoring category includes two primary components: the availability of required technology and the regulatory context. Many of the strategies considered for the Sustainable Freight Strategy are innovative and would rely on emerging technologies that may not yet be available for commercial use. The Existing Conditions and Sustainable Freight Best Practices memorandum and Innovative Strategies Screening memorandum describe numerous strategies being planned in peer cities to take advantage of new fuel types and increasingly sophisticated intelligent transportation systems, for example. The project team included such innovative concepts as appropriate for the regional context. However, strategies dependent on as-yet unproven technologies will likely require additional time or expense for implementation. Similarly, regulation relevant to strategy implementation was considered. Changing state or federal regulations and legislation requires time, expense, and political capital. Accordingly, strategies that require significant changes are considered to have an uncertain path toward implementation.

The two primary components of technological complexity were given equal weight in scoring. If a proposed strategy uses currently available technology and could be implemented based on existing regulations and legislation, it received a score of 3. If one of

those components was satisfied, the strategy received a score of 2. If the proposed strategy required technology development and regulatory change, it received a score of 1.

6.2.5 *Planning Continuity*

Prioritizing consistency with adopted plans underscores the importance of prior planning work and supports the implementation of established goals, objectives, and implementation actions. To determine the consistency of proposed strategies, the project team reviewed numerous plans identified in the Project Management Plan Scope of Work, the Existing Conditions, and the Sustainable Freight Best Practices memorandum. These documents were selected as being especially relevant to developing a Sustainable Freight Strategy and thus reflect a mix of overlapping geographies and focus areas. Documents considered include the following:

- California Sustainable Freight Action Plan
- California Statewide Truck Parking Study
- California Freight Mobility Plan 2020
- California-Baja California Border Master Plan 2021
- Port of San Diego Maritime Clean Air Strategy
- Portside Environmental Justice Neighborhoods Community Emissions Reduction Plan
- Calexico-El Centro-Heber Community Emissions Reduction Plan
- San Diego Regional Medium- and Heavy-Duty Zero-Emission Vehicle Blueprint Near- and Long-Term Implementation Strategies
- SANDAG/ California Department of Transportation (Caltrans) District 11 South Bay to Sorrento, San Vicente, and North County Comprehensive Multimodal Corridor Plans
- SANDAG 2021 Regional Plan
- Southern California Association of Governments Connect SoCal 2020 Regional Transportation Plan/Sustainable Communities Strategy

These plans were reviewed to determine at a high level if the proposed strategies were consistent with documented goals, objectives, and implementation actions. A proposed strategy consistent with those documents was considered a match. Strategies with more matches were considered to have a greater level of planning continuity than those strategies that had fewer matches. In total, 11 documents were evaluated. Strategies with two or fewer matches were considered to have a low level of planning continuity and received a score of 1; strategies with three to six matches were considered to have a medium level of planning continuity and received a score of 2, and strategies with seven or more matches were considered to have a high level of planning continuity and received a score of 3. As with the cost and funding availability criteria, these thresholds were determined to result in a distribution of scores such that approximately one-third of the strategies fell into each scoring category.

As many of these planning documents are updated periodically, planning continuity is certain to change over time. This criterion, like the others, will be reevaluated as updated planning documents are published.

7. IMPLEMENTATION OF KEY STRATEGIES

This section outlines and summarizes 11 key projects, programs, and policies recommended by the Sustainable Freight Strategy via the collective analysis and evaluation outlined in this report. They cover a broad range of potential improvements to the regional freight system, including multimodal infrastructure, the adoption of new technology, and incentives to reduce impacts and improve efficiency.

The highlighted projects are representative examples of improvements recommended in several locations across the study area. The entire project list and evaluation results are available in APPENDIX G, and the complete strategy fact sheets that include information on benefits, costs, funding, development schedule, and implementation challenges and considerations can be found in APPENDIX H.

7.1 Projects

7.1.1 *Zero-Emission Truck Charging and Parking/Staging Area: Otay Mesa Port of Entry*

Adding zero-emission (ZE) truck charging and parking/staging facilities in strategic locations across the region, including around the Otay Mesa POE, will help modernize the goods movement system and create equitable benefits for the environment, communities, and the economy.

Benefits

- ZE charging provides cleaner power than diesel fuel to trucks. Further, it incentivizes the adoption of ZE technology, reducing the emission of greenhouse gases and air pollutants, such as diesel particulate matter.
- New truck parking/staging areas serve a major unmet need by providing resting and waiting areas for truck drivers. Locating these facilities in industrial areas avoids attracting additional truck traffic toward the most vulnerable communities.



While the Otay Mesa POE area is a top candidate for this type of facility, the Sustainable Freight Strategy recommends that similar facilities be constructed strategically to support

a regionwide network. To maximize benefits, this strategy should be deployed near all U.S./Mexico land POEs, near the Port of San Diego marine terminals, and along major goods movement corridors, including I-5, I-8, and I-15, and SR 11, SR 78, SR 86, SR 111, and SR 905.

Estimated Cost & Funding

The estimated project cost is approximately \$5 to \$9 million, including design, construction, and permitting. The cost of ZE truck charging stations will vary depending on the number of chargers, the power level for the chargers, the power available at the site, and any service upgrades needed. This estimate does not include right-of-way acquisition and assumes a charging station facility consisting of four chargers at either 150 kilowatts or 350 kilowatts, depending on the location of the chargers and the duty cycle/requirements of the vehicles. The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- California SBI: Trade Corridor Enhancement Program
- Innovative Charging Solutions for Medium- and Heavy-duty Electric Vehicles
- Rebuilding American Infrastructure with Sustainability and Equity
- California Energy Commission: Charging and Refueling Infrastructure for Transport in California Provided Along Targeted Highway Segments (CRITICAL PATHS)
- Federal Highway Administration (FHWA): Charging and Fueling Infrastructure Discretionary Grant (CFI) Program
- Environmental Protection Agency: Clean Ports Program

Sample Development Schedule

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Preliminary Design	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and design activities
<i>Caltrans Project Study Report (PSR) or similar Conceptual Planning Study</i>	12-18 months following identification of project funding
<i>Preliminary Design</i>	12-18 months following the conceptual planning study
Environmental & Regulatory Review	
<i>CEQA/NEPA Review</i>	12-18 months, concurrent with preliminary design activities. NEPA required for federal funding/facilities
<i>Regulatory Approval of Draft Design, including Federal CBP/GSA, Caltrans, City of San Diego, Energy Utilities</i>	12-18 months, concurrent with preliminary design activities. Includes maintenance and liability agreements
Final Design	6-12 months following all planning, preliminary design,

	environmental and regulatory reviews
Permit Issuance	3-6 months following final design
Construction	12-24 months following permit issuance

The project will require 3 to 5 years for full implementation, including all required planning, design, permitting, and construction. The sample schedule below summarizes the major milestones in the project development process. For projects where power network updates are required, the implementation time will increase depending on the degree of upgrades needed.

Implementation Considerations & Challenges

In the planning of this project, it is essential to consider the incorporation of satellite initiatives that can complement the core strategy, such as truck parking management systems and POE appointment systems. Additional strategies could be implemented which focus on technology interfaces to communicate the availability of truck charging stations and parking spaces, notifying Customs and Border Protection of truck locations in advance of border crossing appointments. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of project implementation include:

- Initial capital cost
- Technical complexities of ZE power supply and integration, including upgrades to utility infrastructure to support vehicle charging
- Requirements for multi-stakeholder coordination, including federal agencies and energy utilities
- Identifying a viable model for ongoing operations and maintenance responsibilities in coordination with public agencies and potential private sector partners

The project’s lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities of planning and design. This includes special focus with local utilities to ensure the project site has sufficient power generation and/or delivery capacity.

7.1.2 Truck Rest Area Parking, Amenities & Zero-Emission Charging: Sunbeam Rest Area

Revitalizing regional rest areas and adding amenities and ZE truck charging and parking facilities in strategic locations across the region, including the Sunbeam rest area, will help modernize the goods movement system and create benefits for the environment, safety, equity, and the economy.

Benefits

- ZE charging provides cleaner power than diesel fuel to trucks. Further, it incentivizes the adoption of ZE technology, reducing the emission of greenhouse gases and air pollutants, such as diesel particulate matter.
- Truck parking areas serve a major need by providing resting areas for truck drivers. Locating these facilities in existing rest areas avoids attracting additional truck traffic toward the most vulnerable communities.
- New rest area amenities provide valuable health, safety, and well-being benefits to the freight vehicle operators that can improve safety, productivity, and enhance network efficiency.



While the Sunbeam rest area is a top candidate for this type of facility, the Sustainable Freight Strategy

recommends that similar facilities be constructed strategically to support a regionwide network. To maximize benefits, this strategy should be deployed at existing rest areas that could feasibly accommodate ZE charging infrastructure, especially those located along major goods movement corridors, including I-5, I-8, and I-15, and SR 11, SR 78, SR 86, SR 111, and SR 905.

Estimated Cost & Funding

The estimated project cost is approximately \$5 to \$15 million, including design, construction, and permitting. The cost of ZE truck charging stations will vary depending on the number of chargers, the power level for the chargers, the power available at the site, and any service upgrades needed. This estimate does not include right-of-way acquisition. The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Department of Energy: Low Greenhouse Gas Vehicle Technologies
- U.S. Environmental Protection Agency: Clean Heavy-duty Vehicle Program
- FHWA: CFI Program

Sample Development Schedule

The project will require 3 to 5 years for full implementation, including all the necessary planning, design, permitting, and construction. The sample schedule below summarizes the major milestones in the project development process. For projects requiring power network updates, the implementation time will increase depending on the degree of upgrades needed.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Preliminary Design	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and design activities
<i>Caltrans Project Study Report (PSR) or similar Conceptual Planning Study</i>	12-18 months following identification of project funding
<i>Preliminary Design and Caltrans Project Report, Design Engineering Evaluation Report, or similar Preliminary Engineering and Project Approval document</i>	12-18 months following the conceptual planning study
Environmental & Regulatory Review	
<i>CEQA/NEPA Review and Document</i>	12-18 months, concurrent with preliminary design activities. NEPA required for federal funding/facilities
<i>Regulatory Approval of Draft Design, including Federal FHWA, Caltrans, City of San Diego, Imperial County, Energy Utilities</i>	12-18 months, concurrent with preliminary design activities. Includes maintenance and liability agreements
Final Design	9-18 months following all planning, preliminary design, environmental and regulatory reviews
Permit Issuance	3-6 months following final design
Construction	12-24 months following permit issuance

Implementation Considerations & Challenges

In the planning of this project, it is essential to consider incorporating satellite initiatives that can complement the core strategy, such as advance signage and outreach to inform drivers of available charging infrastructure and amenities, and deceleration and acceleration lanes to and from the rest area to enhance safe merge and diverge movements on the highway. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of project implementation include:

- Initial capital cost
- Technical complexities of ZE power supply and integration

- Identifying anticipated usage of the site to determine if additional paving and parking is needed
- Requirements for multi-stakeholder coordination, including federal agencies, Caltrans, and local service providers, such as janitorial services, and energy utilities
- Identifying a viable model for ongoing operations and maintenance responsibilities in coordination with public agencies and potential private sector partners

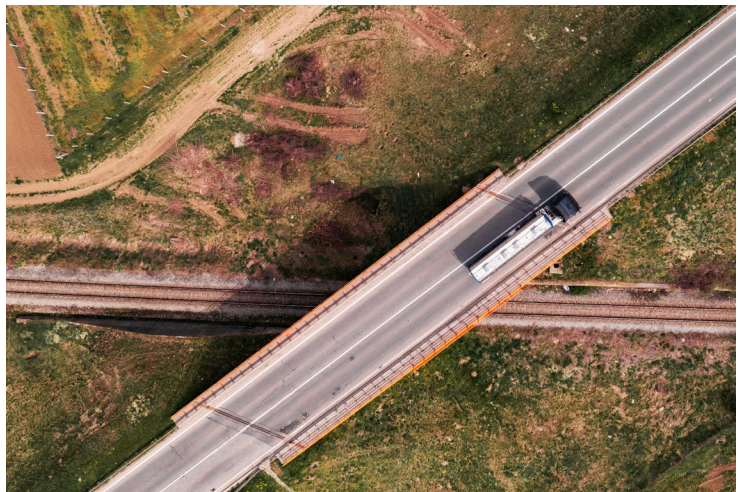
The project’s lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies to help lead all parties through the complexities of planning and design. This includes special focus with local utilities to ensure the project site has sufficient power generation and/or delivery capacity.

7.1.3 Railroad-Roadway Grade Separation: State Route 98 in Calexico

The strategic implementation of railroad-roadway grade separations in critical freight locations across the region, including at the SR 98 intersection in Calexico, will help modernize and advance the efficiency of the goods movement system and create benefits for the environment, safety, equity, and economy.

Benefits

- Improves traffic flow and reduces congestion near the railroad-roadway intersection, increasing transportation efficiency.
- Reduces and mitigates the environmental impacts of railroad and roadway transportation modes through a reduction of emissions.
- Enhances the safety of all railroad and roadway users by preventing any potential collisions.
- Contributes to a higher quality of life for nearby residents by reducing noise and traffic pollution.
- Improves efficiency of goods movement and supports the economy, in areas of high truck traffic.



While the SR 98 railroad-roadway intersection is a top candidate for this type of facility, this Sustainable Freight Strategy recommends that similar facilities be constructed strategically to support a regionwide network. To maximize benefits, this strategy should be deployed at all railroad-roadway intersections along and adjacent to major goods movement corridors, including I-5, I-8, and I-15, and SR 11, SR 78, SR 86, SR 111, and SR 905.

Estimated Cost & Funding

The estimated project cost is approximately \$150 to \$200 million, including design, construction, and permitting. The cost for railroad-roadway grade separations will vary depending on the roadway size and alignment, number of tracks, topography, and any service or safety upgrades needed. This estimate does not include right-of-way acquisition. The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Federal Railroad Administration (FRA): Consolidated Rail Infrastructure and Safety Improvements
- Section 190 Grade Separation Program
- FRA: Railroad Crossing Elimination Program

Sample Development Schedule

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Preliminary Design	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and design activities
<i>Caltrans Project Study Report PSR or similar Conceptual Planning Study</i>	12-18 months following identification of project funding
<i>Preliminary Design and Caltrans Project Report or similar Preliminary Engineering and Project Approval document</i>	18-24 months following the conceptual planning study, including time to enter into a review agreement with Union Pacific Railroad (UPRR) and review of 30% design
Environmental & Regulatory Review	
<i>CEQA/NEPA Review and Document</i>	24-30 months, concurrent with preliminary design activities. NEPA required for federal funding/facilities.
<i>Regulatory Approval of Draft Design, including Federal FRA, Caltrans, City of San Diego, California Public Utilities Commission</i>	12-18 months, concurrent with preliminary design activities. Includes maintenance and liability agreements
Final Design	18-24 months following all planning, preliminary design, environmental and regulatory reviews, including 2-3 months for UPRR review after each of 60, 90, and 100% design and entry into a construction and maintenance agreement after 100% design plans are approved
Permit Issuance	6-9 months following final design
Construction	18-36 months following permit issuance, depending on construction windows allowed by railroad

The project will require 7 to 10 years for full implementation, including all required planning, design, permitting, and construction. The sample schedule below summarizes

the major milestones in the project development process. Rail grade crossing project will require coordination with the railroad throughout design and construction, which is reflected in the durations, below, and further detailed in the implementation considerations section.

Implementation Considerations & Challenges

In the planning of this project, it is essential to consider incorporating satellite initiatives that can complement the core strategy, such as corridor plans with a significant focus on freight, clean freight corridors, truck-only lanes, and freight signal prioritization. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of project implementation include:

- Initial capital cost.
- Technical complexities of engineering design and construction, including achieving consensus on the grade separation alignment.
- Impacts to adjacent properties and local roads, particularly with a roadway realignment strategy.
- Long lead-time coordination for permanent and temporary utility relocations (e.g., overhead electrical lines).
- Potential disruptions of railroad and roadway traffic and/or complex construction staging and temporary facilities to minimize disruptions.
- Potential increase to the project environmental study and impact area due to temporary facilities (e.g., temporary track or roadway alignment).
- Requirements for multi-stakeholder coordination, including federal agencies, Caltrans, energy utilities, and particularly railroads. In this case, the highway crosses the Union Pacific Railroad (UPRR). Coordination with UPRR should start at conceptual design.
- Complementary features may be added to the project scope, which increase roadway capacity on SR 98, such as a new dedicated truck-only lane or additional general-purpose capacity. If so, early coordination with Caltrans is needed to determine if the improvements can be exempted from the California Environmental Quality Act requirements for analyzing and mitigating Vehicle Miles Traveled. If not exempted, these improvements may need to be phased to avoid delays to the grade separation improvements.
- The identification of a viable model for ongoing operations and maintenance responsibilities in coordination with public agencies and potential private sector partners

The project's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help guide all parties through the complexities of planning and design.

7.1.4 Wireless Inductive Charging for Trucks in Queue: Otay Mesa East Port of Entry

Adding wireless inductive or in-road charging for trucks in queue at locations across the region, including at the Otay Mesa Port East of Entry, will help modernize the goods movement system and create benefits for the environment, equity, and the economy.

Benefits

- Wireless inductive charging improves operational efficiency by reducing the total time electric vehicles need to stop at charging locations, offers potential economic savings, and enhances the reliability of electric fleet vehicles.
- Wireless inductive charging has the potential to provide benefits beyond standard electric charging (reduction in emissions, noise pollution, reliance on traditional fueling methods) such as extended range, reduced battery size, adaptability to traffic conditions, and ease of use. Locating these facilities in industrial areas and along already highly congested roadways avoids attracting additional truck traffic toward the most vulnerable communities.



While the Otay Mesa POE area is a top candidate for this type of facility, the Sustainable Freight Strategy

recommends that similar facilities be constructed strategically in areas of high truck traffic. To maximize benefits, this strategy should be deployed near all U.S./Mexico land POEs and near the Port of San Diego marine terminals.

Estimated Cost & Funding

The estimated project cost is approximately \$5 to \$9 million, including design, construction, and permitting. The cost of wireless inductive charging facilities will vary depending on the number of chargers, the power level for the chargers, the power grid capacity, and any service upgrades needed. This estimate does not include right-of-way acquisition and assumes a charging station facility consisting of four 250-kilowatt chargers. The project team evaluated potential funding opportunities and identified several discretionary

funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Advanced Vehicle Technologies
- Vehicle Technologies Office
- Advanced Technology Demonstration and Pilot Projects
- FHWA: Advanced Transportation Technologies and Innovative Mobility Deployment
- FHWA: Strengthening Mobility and Revolutionizing Transportation Grants Program
- FHWA: Charging and Fueling Infrastructure Program
- Maritime Administration: Port Infrastructure Development Program

Sample Development Schedule

The project will require 3 to 5 years for full implementation, including all required planning, design, permitting, and construction. The sample schedule below summarizes the major milestones in the project development process. For projects requiring power network updates, the implementation time will increase depending on the degree of upgrades needed.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Preliminary Design	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and design activities
<i>Caltrans Project Study Report (PSR) or similar Conceptual Planning Study</i>	12-18 months following identification of project funding
<i>Preliminary Design</i>	12-18 months following the conceptual planning study
Environmental & Regulatory Review	
<i>CEQA/NEPA Review</i>	12-18 months, concurrent with preliminary design activities. NEPA required for federal funding/facilities
<i>Regulatory Approval of Draft Design, including Federal CBP/GSA, Caltrans, City of San Diego, Energy Utilities</i>	12-18 months, concurrent with preliminary design activities. Includes maintenance and liability agreements
Final Design	6-12 months following all planning, preliminary design, environmental and regulatory reviews
Permit Issuance	6-12 months following final design
Construction	12-24 months following permit issuance

Implementation Considerations & Challenges

In the planning of this project, it is essential to consider incorporating satellite initiatives that can complement the core strategy, such as reservation systems, truck parking, truck-only lanes, and freight signal prioritization. The integration of these auxiliary

strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of project implementation include:

- Initial capital cost
- Technical complexities of wireless inductive power supply and integration, as well as standardization and compatibility issues
- Requirements for multi-stakeholder coordination, including federal agencies and energy utility providers
- Identifying a viable model for ongoing operations and maintenance responsibilities in coordination with public agencies and potential private sector partners

The project's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities of planning and design. This includes special focus with local utilities to ensure the project site has sufficient power generation and/or delivery capacity.

7.1.5 *Truck-only Lanes: I-5 & SR 905 Between Port of San Diego & Otay Mesa East Port of Entry*

Incorporating truck-only lanes in strategic locations across the region, including on I-5 and SR 905 between the Port of San Diego and Otay Mesa East POE, will benefit freight operations and advance the efficiency of the goods movement system and create benefits for the environment, safety, equity, and economy.

Benefits

- Designated truck-only lanes can enhance freight network efficiency and safety by separating heavy cargo from regular passenger vehicles, helping to alleviate congestion, and improve traffic flow, facilitating a better supply chain by decreasing the total time to deliver goods.
- Reduced wear and tear on general-purpose lane roadway infrastructure by concentrating stress and strain to specific areas, leading to cost savings and roadway longevity.
- Enhanced safety for roadway users by minimizing weaving movements between trucks and passenger vehicles, reducing the potential for conflicts.



- Reduced emissions and fuel consumption through streamlined freight movement and reduced stop-and-go travel.

Estimated Cost & Funding

The estimated project cost is approximately \$80 to \$100 million, including design, construction, and permitting. The cost for truck-only lanes will vary depending on the total length of the lane, topography, specific infrastructure requirements, and any service upgrades needed. This estimate does not include right-of-way acquisition. While these lanes are anticipated to be conversions of existing general-purpose lanes, some right-of-way additions may be needed to accommodate safe merging and transitions. The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- California SBI: Solutions for Congested Corridors
- FHWA: Local Highway Safety Improvement Program
- California SBI: Trade Corridor Enhancement Program
- FHWA: Multimodal Project Discretionary Grant Program

Sample Development Schedule

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Preliminary Design	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and design activities
<i>Caltrans Project Study Report (PSR) or similar Conceptual Planning Study</i>	12-18 months following identification of project funding
<i>Preliminary Design and Caltrans Project Report or similar Preliminary Engineering and Project Approval document</i>	18-24 months following the conceptual planning study
Environmental & Regulatory Review	
<i>CEQA/NEPA Review and Document</i>	36+ months, concurrent with preliminary design activities. NEPA required for federal funding/facilities.
<i>Regulatory Approval of Draft Design Including Federal CBP/GSA, Caltrans, City of San Diego, Energy Utilities</i>	36+ months, concurrent with preliminary design activities. Includes maintenance and liability agreements.
Final Design	24-30 months following all planning, preliminary design, environmental and regulatory reviews
Right-of-Way & Utilities	12-24 months
Permit Issuance	3-6 months following final design
Construction	12-36 months following permit issuance

The project will require 5 to 10 years for full implementation, including all required planning, design, permitting, and construction. The sample schedule below summarizes the major milestones in the project development process. For projects requiring power network updates, the implementation time will increase depending on the degree of upgrades needed.

Implementation Considerations & Challenges

In planning this project, it is essential to consider incorporating satellite initiatives that can complement the core strategy, such as POE efforts that address freight movement, such as truck information and reservation systems, truck-only lanes, clean freight corridors, and truck parking projects. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of project implementation include the following:

- Caltrans requires Vehicle Miles Traveled (VMT) analysis and mitigation for any capacity-enhancing projects on state facilities. A Statement of Overriding Considerations would require approval through the Caltrans Director to allow public circulation of a draft environmental document that includes alternatives that do not fully mitigate for added VMT. Although the truck-only lanes are proposed to be conversions of existing general-purpose lanes, the project is still expected to complete the VMT analysis, and a freeway operations analysis, to evaluate the resulting impacts to operations from the lane conversion. If the freeway operations are projected to fail or cause significant impacts, those will be considered carefully in the context of other regional improvements planned to alleviate congestion or minimize VMT, and the project might have difficulty obtaining approval to move forward.
- Public comment period during circulation of the environmental document may be challenging due to the proposal to convert existing lanes to truck-only lanes.
- Initial capital cost.
- Technical complexities of engineering design and construction, including identifying logical begin and end points of truck-only lanes, providing truck passing lanes if determined to be needed, safely accommodating interchange entrance and exit ramp movements, developing advanced signage to safely transition passenger vehicles and trucks into and out of their dedicated lanes, and transitioning to POE infrastructure and technology.
- Right-of-way acquisition and potential disruptions of roadway traffic.
- Long-term enforcement of truck-only lanes to prevent passenger vehicles from impeding truck traffic throughput and safe maneuverability.
- Requirements for multi-stakeholder coordination, including federal agencies, Caltrans, local agencies, and energy utilities.

The project’s lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities of planning and design.

7.2 Programs

7.2.1 Incentives for Businesses to Purchase Cargo Bikes

Encouraging businesses to adopt eco-friendly cargo bikes for delivery and transportation needs can benefit urban and high-density areas. A study to explore incentives and address regulatory barriers for using cargo and electric cargo bikes in denser urban areas for first-/last-mile delivery, as well as supportive infrastructure, can advance the sustainability and efficiency of delivery and transportation services and promote local development.

Benefits

- Mitigate freight network effects on the environment by reducing the emission of greenhouse gases and air pollutants, such as diesel particulate matter. It is estimated that a single cargo bike can save 13 tons of carbon dioxide emissions per year.
- Alleviate urban traffic congestion. Cargo bikes can offer increased route flexibility compared to large delivery trucks by using vehicle and bicycle infrastructure.
- Decrease operating costs for businesses.

The study for this program will address elements required for implementation, including incentives, infrastructure needs, emissions and congestion evaluation, program guidelines, and local stakeholder outreach to encourage program adoption.



Estimated Cost & Funding

The cost for a regional study to implement incentives for businesses to purchase cargo bikes is estimated to be between \$300,00 and \$400,000. It will vary depending on the size of the study and types of incentives considered (e.g., Transportation Demand Management Plan, providing loading/curb space, curb management tools, on-street charging, and secured parking etc.). Similar pilots include the following:

- Boston Transportation Department: 18-month program subsidizing delivery costs for eight businesses and providing e-bikes for \$345,000

- Colorado Energy Office: solicitating proposals to develop and implement eCargo bike deployment projects that replace commercial delivery vehicles for \$240,000

The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Caltrans: Active Transportation Program
- FHWA: Active Transportation Infrastructure Investment Program
- FHWA: Carbon Reduction Program

Sample Development Schedule

The study will require 2 to 3 years for full implementation, including all required procurement, planning, and stakeholder coordination. The sample schedule below summarizes the major milestones in the planning process.

Milestone	Estimated Schedule
Identification of Study Funding	Ongoing
Study Development	
<i>Define program guidelines (Vehicle Specifications, Safe operation, Data Sharing, Loading/Unloading, Education and Enforcement)</i>	3-6 months
<i>Community & Stakeholder Outreach</i>	Ongoing throughout study activities
<i>Caltrans Project Study Report (PSR) or Pilot Program Recommendations</i>	12-18 months following identification of project funding and procurement
<i>Evaluation Report/Findings</i>	6-12 months following pilot program implementation
Environmental & Regulatory Review	
<i>CEQA/NEPA Review</i>	Exempt

Implementation Considerations & Challenges

To move forward and implement recommendations from the study, it is essential to consider incorporating satellite initiatives to complement the core strategy, such as expanding bike-ped infrastructure and low-emission zone policies.

Considerations for the implementation of a cargo bike program include:

- Working with the private sector to identify barriers to the wider adoption of cargo bikes and work to lower infrastructure or regulatory barriers
- Working with the private sector to disseminate information on cargo bikes and establish peer knowledge exchanges

The potential challenges of program implementation include:

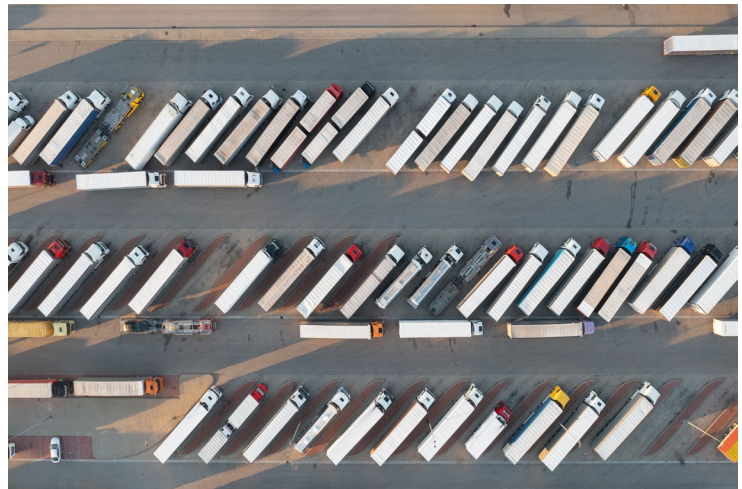
- Initial capital cost of acquiring cargo bikes and necessary infrastructure for storage, charging, cargo bike parking, and maintenance.
- Business hesitation and concerns about delivery efficiency and capacity limitations.
- Legal context and local regulations for cargo bikes.
- Program monitoring and reporting.
- Staff time to manage cargo bike pilot and operator permit program for businesses.
- Potential policy hurdles. For example, updating e-bike definition to adjust maximum width limits and needing to create “Cargo Bike Loading Only” curb regulation.

7.2.2 Support for Private Truck Parking Site Development

Developing additional truck parking facilities is an essential aspect of the framework that improves overall freight network efficiency. Designated truck parking sites help to facilitate the electrification of truck fleets, improve fluidity and operations, reduce impacts from vulnerable communities, and increase economic competitiveness and opportunities. More parking locations would also reduce driver fatigue and provide drivers with a place to wait in advance of completing their trip.

Private truck parking facilities provide 92 percent of all parking spaces in the state of California. While the private sector will continue to play an integral role in developing parking facilities, there are actions the public sector can take to facilitate and leverage more private investment. Building on

initial studies carried out by the Caltrans 2022 California Statewide Truck Parking Study (including Appendix F, Public-Private Partnership Action Plan: Partnership Screening Tool and Scenario Analysis) and Washington State Department of Transportation 2021 Washington State Truck Parking Action Plan, a regional program would consist of a study to look at opportunities for encouraging private truck parking site development. A few potential private partnership incentive ideas that can be considered under this program include:



- Potential commercial tax incentives and/or permitting and zoning incentives for property owners to provide truck parking.

- Agreement and tax incentive structures with businesses and facilities with large existing parking facilities used only on a periodic or seasonal basis, such as a stadium, to be used for truck parking when not in use for its intended purposes.
- Collaboration with private developers and investors of electric vehicle charging facilities and private truck parking facilities.
- Usage of federal and other state grants to expand truck parking as a way to partner and incentivize with private investors and developers.
- Usage and promotion of mobile applications to allow property owners to market their available space and truck drivers and companies to identify, reserve, and pay for parking at available locations, expanding the pool of inventory and providing a financial incentive for participating property owners.

Benefits

- A decrease in unauthorized truck parking in non-designated areas can provide benefits to vulnerable communities near industrial areas. When parked in designated parking sites, trucks do not have to idle, thus reducing emissions.
- Truck parking sites provide enhanced driver health through on-site amenities and driver safety by removing on-street parking incidents.
- Developed and modernized truck parking sites offer a base to apply electric vehicle and ZE technology.
- An improvement in freight network facilities has the potential to attract additional economic and financial opportunities.

Recent studies in California and numerous states around the country, as well as the FHWA Truck Parking Development, describe the difficulties that truck drivers have in finding parking, particularly in and near urban areas. This program addresses the critical need for secure and accessible parking facilities for these freight drivers. Under this program, a study would be conducted to provide insight into the demand, logistics, incentives, and regulatory factors that can determine best practices to support the development of truck parking sites and in turn improve the efficiency of the freight network.

Estimated Cost & Funding

This study is estimated to cost between \$400,000 and \$600,000.

The project team evaluated potential funding opportunities and identified discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- FHWA: CFI Program

The study will require 2 to 3 years for completion, including all required data gathering, analysis, planning, and stakeholder engagement. The sample schedule below summarizes the major milestones in the program development process.

Sample Development Schedule

Milestone	Estimated Schedule
Identification of Plan Funding	Ongoing
Planning and Policy Study	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning activities
<i>Data Gathering and Analysis</i>	6-8 months following identification of study funding
<i>Technical Study and Recommendations</i>	18-24 months following data gathering and analysis
Program Development	6-12 months following completion of the study, including jurisdictional reviews and approvals.
Environmental & Regulatory Review	
<i>CEQA/NEPA Review</i>	Exempt

Implementation Considerations & Challenges

In planning this project, it is essential to consider incorporating initiatives that can supplement the core strategy, such as electric vehicle truck corridors and truck-only lanes. These additional strategies would provide compound benefits to the freight network and have multiplier effects for sustainability benefits.

The potential challenges of program implementation include:

- Identifying appropriate funding sources and obtaining approvals for incentives to fund development on private sites.
- Obtaining the necessary data from private companies to understand current parking dynamics.
- Obtaining local jurisdictional support for a program that sites truck parking facilities.
- Addressing regulatory and zoning requirements, such as maintaining long-term viability and safety.
- Coordinating efforts among private entities, government agencies, and logistics companies.

The program’s lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies to help lead all parties through the complexities of planning and design. Key stakeholders include local jurisdictions, private trucking companies, and parking operators.

7.2.3 Dynamic Curb Regulation

Analyzing curb space management practices through dynamic or real-time management systems in urban areas can help alleviate issues along heavily congested corridors. This approach uses technology and data to dynamically allocate curb space for various purposes based on current needs and demand.

Benefits

- Optimized parking: Dynamic curb regulation allows real-time monitoring and adjustment of parking and freight loading availability.
- Increased accessibility to delivery points and improved freight movement efficiency.
- Reduced traffic congestion: Efficient curb management can enhance curb space utilization and reduce overall congestion by preventing unnecessary circling for parking. When drivers have real-time information about parking and loading availability, they can more quickly make deliveries and avoid double parking.
- Streamlined truck operations can minimize environmental impacts by reducing emissions during first- and last-mile deliveries.



A study on dynamic curb regulation should identify congested, dense urban locations for a pilot program. The study should seek pilot locations and analyze the potential impacts of dynamic curb regulation on increased revenue generation, enhanced accessibility, improved freight and delivery operations, reduced traffic congestion, flexible use of curb space, and using data to make decisions.

In the planning of this project, it is essential to consider the incorporation of initiatives that can complement the core strategy, such as Smart Loading Zones, which allow delivery operators to enroll for Smart Loading permits that can share vehicle location data to seamlessly pay for their use of curbsides on a per-minute basis. Smart Zones can also allow authorized drivers to reserve a space for a limited time through a smartphone app or other mechanism, which can encourage more orderly curbs.

Estimated Cost & Funding

The cost for this study is estimated to be between \$500,000 and \$750,000 and will vary depending on the size and whether it recommends a pilot or broader implementation.

The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Caltrans: Sustainable Transportation Planning Grants
- FHWA: Carbon Reduction Program

The program will require 3 to 5 years for full implementation, including all required study, program, and policy development and pilot design. The sample schedule below summarizes the major milestones in the program development process.

Sample Development Schedule

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Program Development	
<i>Project initiation: Regulatory Policy Framework and Compliance, Technology Assessment, Pilot program design</i>	6-12 months
<i>Community & Stakeholder Outreach and engagement</i>	Ongoing throughout planning and program development activities
<i>Planning and Policy Development</i>	18-24 months following identification of study funding
<i>Program or Pilot implementation, including infrastructure preparation, data collection and analysis, evaluation, and adjustment</i>	18-36 months following the planning study
Environmental & Regulatory Review	
<i>CEQA/NEPA review</i>	Exempt

Implementation Considerations & Challenges

In the planning of this project, it is essential to consider the incorporation of initiatives that can complement the core strategy, such as Smart Loading Zones, which allow delivery operators to enroll for Smart Loading permits that can share vehicle location data to seamlessly pay for their use of curbsides on a per-minute basis. Smart Zones can also allow authorized drivers to reserve a space for a limited amount of time through a smartphone app or other mechanism, which can encourage more orderly curbs.

The potential challenges of program implementation include:

- Jurisdictional coordination.
- Creating responsive regulations that adapt to changing conditions and ensure equitable access for various users like vehicles, pedestrians, and cyclists.
- Lack of availability of real-time data inputs collected from sensors, cameras, and other technologies.

- Cities have encountered implementation challenges, including local business pushback, technical challenges, and regulatory barriers.

The program’s lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies to help lead all parties through the complexities of planning and design.

7.3 Policies

7.3.1 Overweight Truck Route Planning

Increasing weight limits along corridors is a strategic way to improve the efficiency of the goods movement system and has the potential to advance the electrification of the freight transportation network.

Benefits

- Allows for heavier electric freight vehicles to travel along corridors that previously had weight restrictions.
- Removing weight restrictions has potential to advance planning and development of electrification projects along transportation corridors.



Study the potential for increasing weight limits for battery electric medium- and heavy-duty vehicles on clean freight corridors and other truck routes, and policy support for legislative changes. Potential corridors include I-5, I-15, I-8, I-805, SR 905, and SR 11. The result of this study could include recommendations for policy and infrastructure changes to support electric truck operations on these and other routes.

Estimated Cost & Funding

A study to develop the policy and evaluate its potential implementation is estimated to cost between \$400,000 and \$800,000 depending on the number and degree of detail of corridors studied. It is envisioned that this study would detail the potential policy and regulatory changes needed to enable battery electric vehicles to operate on San Diego and Imperial County highways, including an assessment of the vehicles available in the market that would be deployed in this area. That assessment would enable policymakers to understand what type of wear and tear would be expected on the roadway system and

what, if any, infrastructure improvements should be anticipated based on the anticipated reduced life cycle of roads and bridges.

The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Caltrans: Sustainable Transportation Planning Grants
- FHWA: Carbon Reduction Program
- FHWA: Multimodal Project Discretionary Grant Program

Sample Development Schedule

The study to develop and evaluate the policy will require 2 to 3 years to complete, including all required planning, evaluation, and stakeholder engagement. The sample schedule below summarizes the major milestones in the policy development process.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning and Policy Study	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and policy development activities
<i>Data Gathering and Analysis</i>	6-8 months following identification of study funding
<i>Technical Study and Recommendations</i>	18-24 months following data gathering and analysis
Policy Development	6-12 months following completion of study, including jurisdictional reviews and approvals
Environmental & Regulatory Review	
<i>CEQA/NEPA review</i>	Exempt

Implementation Considerations & Challenges

In planning this project, it is essential to consider incorporating satellite initiatives that can enhance the core strategy, such as truck parking, electric truck charging, and truck-only lanes. These additional strategies would provide compound benefits to the freight network and have multiplier effects for sustainability benefits.

The potential challenges of policy implementation include:

- The definition and enforcement of appropriate weight limits.
- The additional impacts to infrastructure and a potential increase in wear on routes with increased weight limits, including possible preventive maintenance.
- Economic impacts from an increase or decrease in truck volume along roadways.
- Public acceptance both at the community and jurisdictional level.

The program's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies to help lead all parties through the complexities of planning, policy development, and potential implementation.

7.3.2 Low-Emissions Zones

Creating defined areas where the use of emitting freight vehicles is regulated can directly influence the vehicle fleet composition on public roadways to help advance the sustainability of the goods movement system and create benefits for the environment and equity. Identifying strategic locations across the region to pilot LEZs with location-specific regulations will benefit the health of these communities and provide a framework for regionwide implementation.

Benefits

- Reduction of air pollution, improvement of public health, lowering of greenhouse gas emissions, and enhancement of quality of life for residents.
- Reduction of congestion from freight traffic and increased efficiency.
- Stimulus for the adoption of cleaner transportation technologies.



Establishing an LEZ in dense urban areas will enhance quality of life for residents and improve equity and health for disadvantaged communities. An LEZ could also catalyze investments in adoption of cleaner transportation technologies by signaling a demand for ZE freight vehicles.

LEZ initiatives can be introduced through regulations and sustainability directives or financial incentives. This study would examine examples nationally and internationally to identify the type of program and incentives that would be most appropriate for Southern California. The study would also consider locations within the region that would be most appropriate to implement a pilot LEZ program.

Similar studies include:

- London LEZ: The zone, which includes most of Greater London, enforces an emissions standard based charge to non-compliant commercial vehicles. With implementation of the LEZ, the zone observed a 44% reduction of nitrogen dioxide emissions between 2017 and 2020.

- City of Santa Monica, Zero Emission Delivery Zone Pilot: In partnership with the Los Angeles Cleantech Incubator, the City of Santa Monica deployed a pilot voluntary Zero Emission Delivery Zone. The zone encompasses a 1-square-mile area in the commercial activity core of Santa Monica and prioritizes ZE last-mile delivery. One of the City’s goals for the pilot is to provide a blueprint for cities to adopt ZE delivery zones and provide best practices for other ZE zones.

Estimated Cost & Funding

The study to evaluate the potential implementation of this policy is estimated to cost \$250,000 to \$500,000 depending on the range of locations and regulations considered.

The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- FHWA: Strengthening Mobility and Revolutionizing Transportation Program
- Caltrans: Sustainable Transportation Planning Grants
- FHWA: Carbon Reduction Program

Sample Development Schedule

The policy will require 2 to 4 years for completion, including all required planning and public engagement. The sample schedule below summarizes the major milestones in the policy development process.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Policy Study	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning activities
<i>Data Gathering and Analysis</i>	6-8 months following identification of study funding
<i>Pilot or Program Development and Recommendations</i>	12-18 months following data gathering and analysis
Pilot or Program Implementation	12-24 months following completion of pilot or program development, including jurisdictional reviews
Environmental & Regulatory Review	
<i>CEQA/NEPA review</i>	Exempt

Implementation Considerations & Challenges

In planning this project, it is essential to consider incorporating satellite initiatives that can complement the core strategy, such as cargo bikes, ZE truck charging, and curb regulations.

The potential challenges of policy implementation include:

- Identifying appropriate incentive funding sources.
- Ensuring that freight delivery companies have access to clean fuel technology vehicles and charging infrastructure.
- Establishing clear and enforceable emission standards and restrictions and defining the boundaries of LEZs.
- Ensuring widespread compliance and enforcement mechanisms to identify and penalize high-emission vehicles if regulatory approach is taken.
- Obtaining appropriate approvals if regulatory approach is taken.
- Impacting businesses and considering alternative transportation options for affected businesses and individuals.

The program's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies to help lead all parties through the complexities of planning and design.

7.3.3 *Recommendations on Land Use Compatibility*

Land use strategies related to freight can support freight operations while minimizing adverse impacts on local residents and the environment. A study to identify recommendations on land use compatibility will support the creation of benefits for the environment, safety, and equity, while meeting freight operational needs.

Benefits

- More efficient land utilization and decreased land-use disputes.
- Increased community cohesion, improved quality of life for residents, and enhanced safety.
- Minimized noise and visual impacts on residents.
- Improved freight capacity while reducing congestion.
- Improved accessibility to the freight transportation network for communities and businesses.

Freight generating land uses can benefit a region by providing jobs, tax dollars, and proximity of goods to growing populations and businesses. However, negative impacts associated with freight and industrial land uses include congestion, air quality and



greenhouse gas emissions, noise, and safety. Vulnerable communities often receive significant environmental impacts from freight generating land uses. Developing recommendations on land use compatibility for freight will allow freight operations to provide benefits to the region while identifying opportunities to minimize adverse impacts.

Recommendations on land use compatibility will consider truck parking, warehouses, and industrial uses, as well as increasing buffer zones near residential, schools, and other sensitive uses. Adequate and strategically located authorized truck parking can increase efficiency, safety, and environmental benefits by reducing the need for driver circulation and conflicts with sensitive land uses by parking in unauthorized locations.

Recommendations will consider appropriate areas to maintain or add truck parking and industrial land use availability.

Estimated Cost & Funding

The study to evaluate land-use compatibility recommendations is estimated to cost between \$400,000 and \$600,000 depending on the scope of stakeholder and community engagement and if design guidelines are included.

The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Caltrans: Sustainable Transportation Planning Grants
- FHWA: Carbon Reduction Program

Sample Development Schedule

The policy will require one to 2 years for completion, including all required planning and public engagement. The sample schedule below summarizes the major milestones in the policy development process.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Policy Study	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning activities
<i>Data Gathering and Analysis</i>	2 months following identification of study funding
<i>Recommendations</i>	10-22 months following data gathering and analysis
Environmental & Regulatory Review	
<i>CEQA/NEPA review</i>	Exempt

Implementation Considerations & Challenges

In the planning of this study, it is essential to consider the incorporation of satellite initiatives that can enhance the core strategy, including LEZs, truck charging and staging

areas, and truck parking site development. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of policy implementation include:

- Extensive research and analysis to ensure land use recommendations align with community needs, environmental considerations, and economic development goals.
- Gaining buy-in and cooperation from various stakeholders, including property owners, local governments, and developers.
- Navigating zoning regulations, land use planning, and community input while striving for optimal land use compatibility demands effective communication, collaboration, and a fine-tuned policy framework.

The program's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities implementing this planning policy.

8. WORKFORCE DEVELOPMENT TOOLKIT

The Workforce Development Toolkit is a comprehensive resource addressing the sustainable freight workforce in the region. The toolkit comprises three main components: a labor market analysis, an inventory of relevant training and education programs, and recommendations. As sustainable freight projects continue to evolve in the region, it is crucial for the workforce to acquire skills aligned with emerging demands. The labor market analysis, facilitated by Lightcast software, examines internet-wide job postings and profiles in real time to identify skill gaps and inform decision-making in training development, hiring, funding allocation, and project prioritization. The insights gathered emphasized the need for targeted training, addressing peripheral jobs, engaging youth, securing funding for high-level training, and conducting awareness campaigns for sustainable freight career opportunities.

This toolkit serves as a valuable guide for stakeholders navigating the dynamic landscape of the sustainable freight workforce. An overview of the findings is provided as follows, and a complete report is included in APPENDIX I.

8.1 Sustainable Freight Labor Market Analysis

The sustainable freight workforce is defined as occupations with competencies that are foundational to addressing the role of sustainability within all organizations, across multiple industries, and in both the public and private sector.

Key competencies required for the sustainable freight workforce include the following:

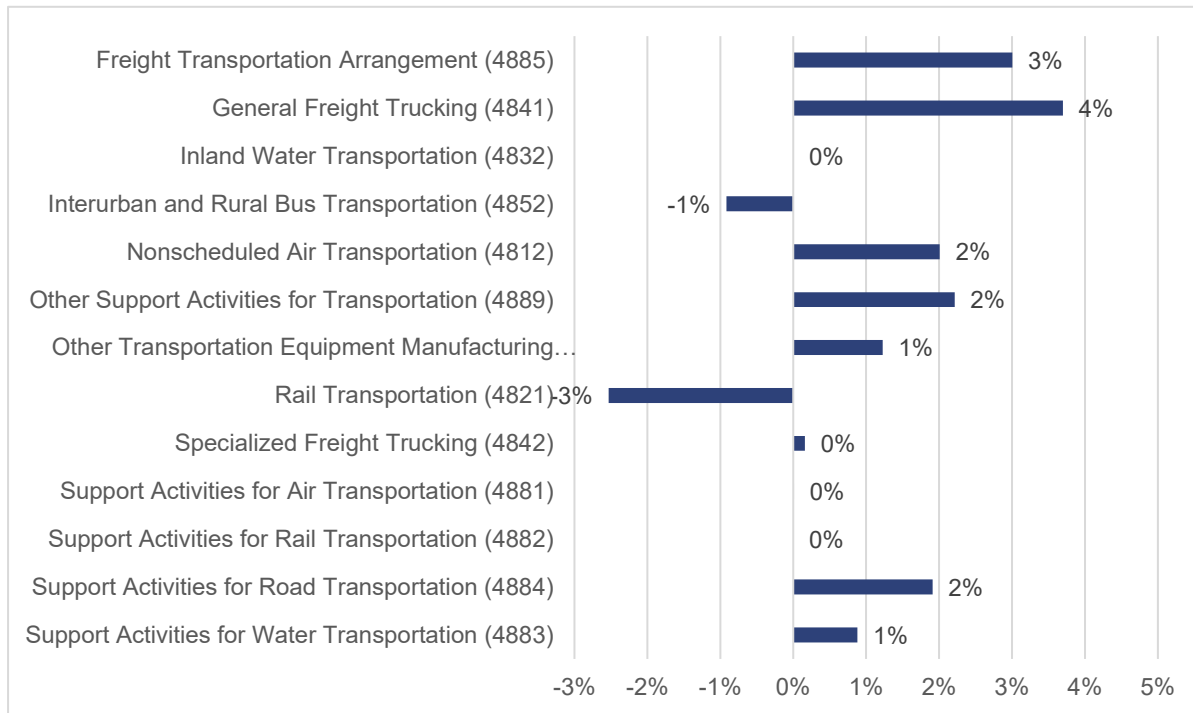
- Understanding regulatory compliance
- Understanding energy, infrastructure, and sustainability ecosystems
- Using data and metrics for process improvements and reducing transaction costs
- Understanding legal issues in risk management

The labor market analysis was conducted using data from the U.S. Census Bureau and U.S. Department of Labor, and labor market analysis tools. The top specialized skills in job postings related to sustainable freight occupations as compared to the job profiles can be seen in Figure 7, and the changes in occupational demand over time can be seen in Figure 8.

Figure 7: Top Specialized Skills in Job Postings vs Job Profiles (2022-2023)



Figure 8: Percent Change in Number of Occupations (January 2022-October 2023)



8.2 Training and Education Inventory

Once sustainable freight skill and occupation gaps have been identified, training and education programs must be in place to prepare the workforce with the proper expertise and fill the occupations in demand. Developing and filling these programs requires both employer interest and an appropriate population of interested applicants with a desire to join the sustainable freight workforce. The most frequent degrees required were Public Administration, Transportation Planning, and Urban Planning. These degrees were added to a list that was cross referenced with the programs offered by schools in and around San Diego and Imperial Counties.

A complete inventory of current relevant programs that provide training for skills in demand for sustainable freight projects and programs can be found in APPENDIX I.

8.3 Recommendations

Labor market analysis tools like Lightcast can be leveraged to keep an awareness of workforce needs as new sustainable freight projects and technologies change the skills and occupations in demand. The analyses need to be considered within the context of the limitations due to standardized job and skill categories. New titles and/or skills might not be captured, but real-time internet data offers a valuable overview. Sustainable freight as an area of study is still in development and reflects a merger of traditional disciplines. There is an opportunity to provide new content through existing programs. Absent adequate training programs, employers will look for opportunities to build upon foundational skills and then teach to their own work culture.

To prepare for the evolution of workforce needs as identified in labor market analyses, existing training and degree programs will need to accommodate the demand for emerging skills. SANDAG, ICTC, and other appropriate agencies could assist in developing modular instruction, with subject matter experts, for the identified skills that instructors in degree and training programs can easily plug into existing courses. In the longer term, SANDAG and other public agencies could support curricular development and implementation of education and training programs by developing a Workforce Development Committee (WDC). The committee could keep a pulse on the changing skills and occupations in demand for sustainable freight projects and regional programs. The committee could leverage labor market analysis and include members from stakeholders in the region that would promote training related to jobs anticipated to face a shortfall of labor. Training stakeholders could include those listed in Appendix I, Table 2, the inventory of sustainable freight degrees and training in San Diego and Imperial Counties, as well as companies, public agencies, and other stakeholders that work directly and indirectly on sustainable freight projects and programs. A committee composed of these stakeholders

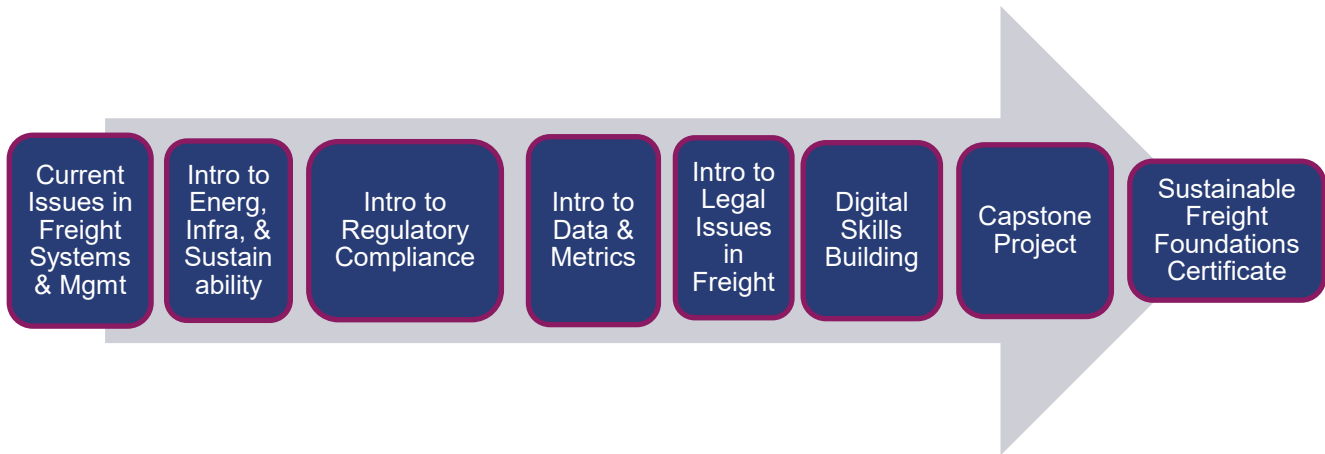
would create a forum for discussion on relevant and emerging skills, jobs, and training between public agencies such as SANDAG, ICTC, or Caltrans, experts in sustainable freight, and experts in training program development. Specific actions for the committee include the following:

- The WDC could convene industry, government, and education leaders to design, pilot, and scale modules that any instructor could use to address sustainable freight skills gaps. Developing such modules would assist traditional academic institutions by providing easily integrated sustainable freight modules that instructors at training programs in San Diego and Imperial Counties could use in the near term. Careful measuring and tracking of the success of these modules would be an important part of this deployment.
- The WDC could use the same process to develop not-for-credit certifications and custom training in collaboration with continuing and professional education and extension units. This approach would ensure that emerging, incumbent, and displaced professionals can access non-degree sustainable freight development opportunities.
- The WDC could help identify expert practitioner guest speakers to participate in the credit and not-for-credit education and training programs.
- In the longer term, the WDC could work with leaders in industry, government, and education to develop targeted sustainable freight courses with articulation agreements between community colleges, four-year, and graduate programs to create new sustainable freight educational pathways.
- After implementing, measuring, and tracking the success of the preceding four recommendations, the WDC could convene champion educators to host a train-the-trainer session to disseminate lessons learned and best practices to less initiated teachers.

Training programs such as the California Sustainable Freight Action Plan (CSFAP) Sustainable Freight Certificate are developed with labor market analysis and stakeholder input and can serve as a model for providing training in response to changing workforce demands. The Sustainable Freight Certificate is an evolving program that incorporates public, private, and academic feedback and recommendations for up-to-date and relevant training and skillset development. The training program comprises six sessions and a capstone project that covers the topics and skills shown in Figure 9. The certificate was designed in response to the emergence of ZE vehicles and related policies, but the approach can be replicated to address any skill that is new or facing increased demand. Incorporating feedback and recommendations from public, private, and academic sustainable freight project stakeholders will aid in developing training programs and curricula that provide the most relevant skills in demand. If developed specifically for San

Diego and Imperial Counties, skills training could be modified to be most relevant to the region's sustainable freight projects and programs.

Figure 9: Sustainable Freight Certificate



Additionally, employer-focused approaches to addressing the demand for emerging skills can complement training provided at external organizations. SANDAG, ICTC, and other appropriate agencies could develop and/or provide materials for consumption that educate employers on alternative hiring approaches. Such approaches include hiring non-traditional employees (i.e., those who do not have the most directly relevant degree or certification) and providing in-house training and upskilling as part of onboarding new hires.

9. CONCLUSION & RECOMMENDATIONS

The goal of the Sustainable Freight Strategy is to implement multimodal freight-related projects and policies that improve sustainability and lessen disproportionate environmental health burdens on vulnerable communities and tribal governments while supporting the region's economy and its role as a trade gateway.

A comprehensive list of strategies located throughout the study area was developed to address and improve the sustainability of the regional freight system. These strategies are outlined in full in the Strategy Evaluation Scoring Matrix outlined in Section 6.

This report highlights 11 key projects, programs, and policies and provides a detailed assessment of strategy benefits, costs and funding, development schedule, and challenges and considerations. These 11 strategies are representative examples of improvements recommended in several locations across the study area. Another important strategy is the use of Intelligent Transportation Systems for border applications such as the appointment system and grade separations. These key recommendations cover a broad range of potential improvements to the regional freight system, including multimodal infrastructure, the adoption of new technology, and incentives to reduce impacts and improve efficiency.

A Workforce Development Toolkit was developed that offers analysis and solutions for the sustainable freight workforce in the study area. The toolkit has two main components: a labor market analysis and an inventory of relevant training and education programs. The labor market gaps analysis concluded that the gaps in in-demand specialized skills are construction, electrical engineering, and procurement.

It is recommended that a Workforce Development Committee (WDC) be established. The WDC would create a forum for discussion on relevant and emerging skills, jobs, and training. Specific actions for the WDC to take include the following:

- Convene industry, government, and education leaders to design, pilot, and scale modules that any instructor could use to address sustainable freight skills gaps
- Develop not-for-credit certifications and custom training in collaboration with continuing and professional education and extension units
- Identify expert practitioner guest speakers to participate in the credit and not-for-credit education and training programs
- Work with industry, government, and education leaders to develop targeted sustainable freight courses
- Convene champion educators to host a train-the-trainer session to disseminate lessons learned and best practices to less initiated teachers

In addition to creating the WDC, it is also recommended that SANDAG, ICTC, or other appropriate agencies create a data dashboard that helps display the high demand for skills with many existing training options and visualize the skills gaps to help develop degree and training programs.

Lastly, it is recommended that SANDAG, ICTC, or other appropriate agencies institute an employer-focused program to address the demand for emerging skills and provide materials that educate employers on alternative hiring approaches. Such approaches include hiring non-traditional employees and providing in-house training and upskilling as part of onboarding new hires.

10. APPENDICES

Appendix A Final Existing Conditions Assessment Memorandum

Appendix B Memo Addendum

Appendix C Innovative Strategies Screening Memorandum

Appendix D Public Outreach Plan Memorandum

Appendix E MetroQuest Survey Summary

Appendix F Focus Groups Summary

Appendix G Final Benefits and Feasibility Scoring Memorandum

Appendix H Summary Fact Sheets for Key Strategies

Appendix I Workforce Development Toolkit Memorandum

Appendix A:

Final Existing Conditions Assessment

Memorandum



SAN DIEGO AND IMPERIAL COUNTIES SUSTAINABLE FREIGHT IMPLEMENTATION STRATEGY

FINAL EXISTING CONDITIONS AND SUSTAINABLE FREIGHT BEST PRACTICES

September 2022

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2.	Summary of Findings.....	2
3.	Review of Existing Plans and Studies.....	5
4.	Summary of Best Practices Review	27
5.	Draft Screening Framework	52

1. PURPOSE AND SCOPE

As part of the San Diego and Imperial Counties Sustainable Freight Implementation Strategy, this report focuses on the Existing Conditions Assessment that documents existing and upcoming sustainable trends, case studies, and pilots in the freight sector. This report includes a summary of relevant state, regional, and local plans, a review of best practices in sustainable freight, and a proposed screening framework for use in evaluating projects and policies for inclusion in the implementation strategy.

2. SUMMARY OF FINDINGS

An extensive literature review and analysis of best practices within the current realm of sustainable freight projects and policies was conducted, as part of the Task 3.1, Deliverables for the Existing Conditions Assessment, under Task 3. In this literature review, extensive documents, reports, and industry newsletters were screened and reviewed to identify existing and upcoming sustainable trends, case studies, and pilots in the freight sector. While focusing on best practices and examples relevant to the study area in the San Diego region and the state of California, the team also reviewed various reports from other jurisdictions within the United States and Europe. A full description of each of the documents is detailed in Section 1.

After conducting literature reviews on existing practices and conditions within the San Diego Association of Governments (SANDAG) and Imperial County Transportation Commission (ICTC) region and reviewing case studies and practices from other regions and countries, the team utilized the following process to screen for and determine best practices suitable for San Diego and Imperial Counties Freight Implementation Strategy, as shown in Figure 1. Based on more than 30 studies and reports, the team identified three key categories of sustainable freight best practices and 17 specific technologies/strategies. These best practices categories include:

- Technology Solutions
- Fleet Management and Operational Solutions
- Infrastructure Improvements

Figure 1: Task 3 Existing Conditions Assessment Process

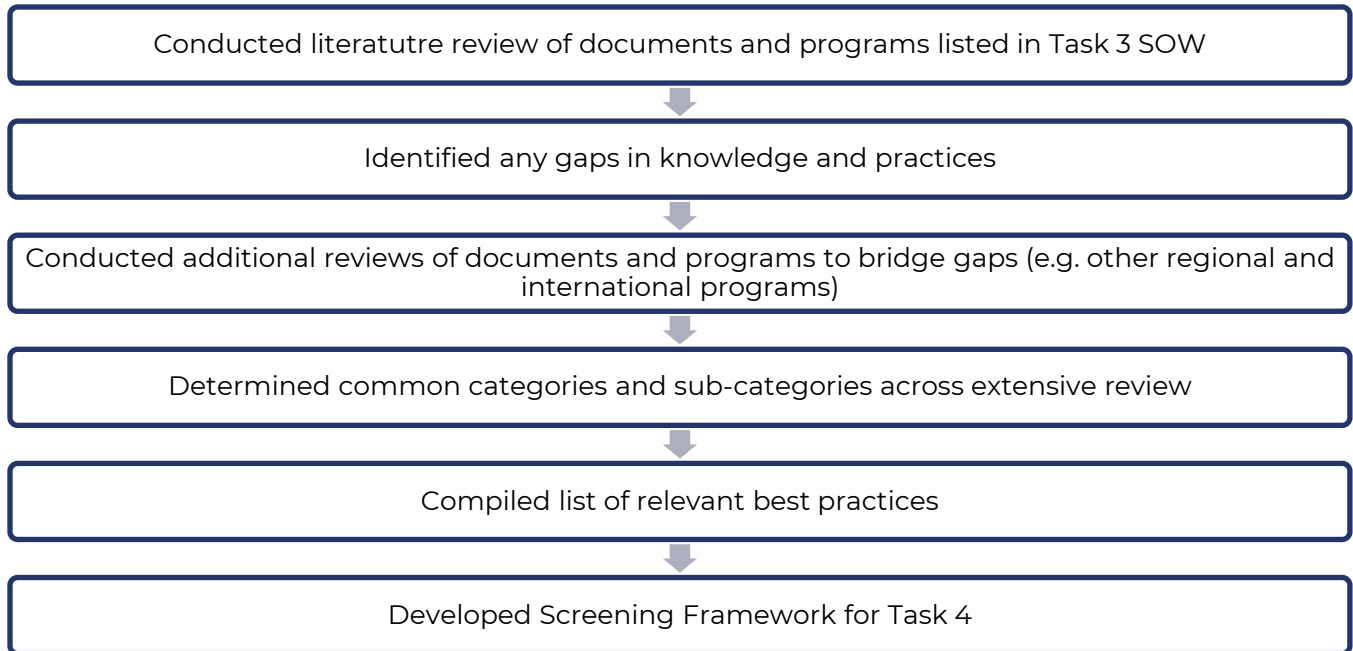
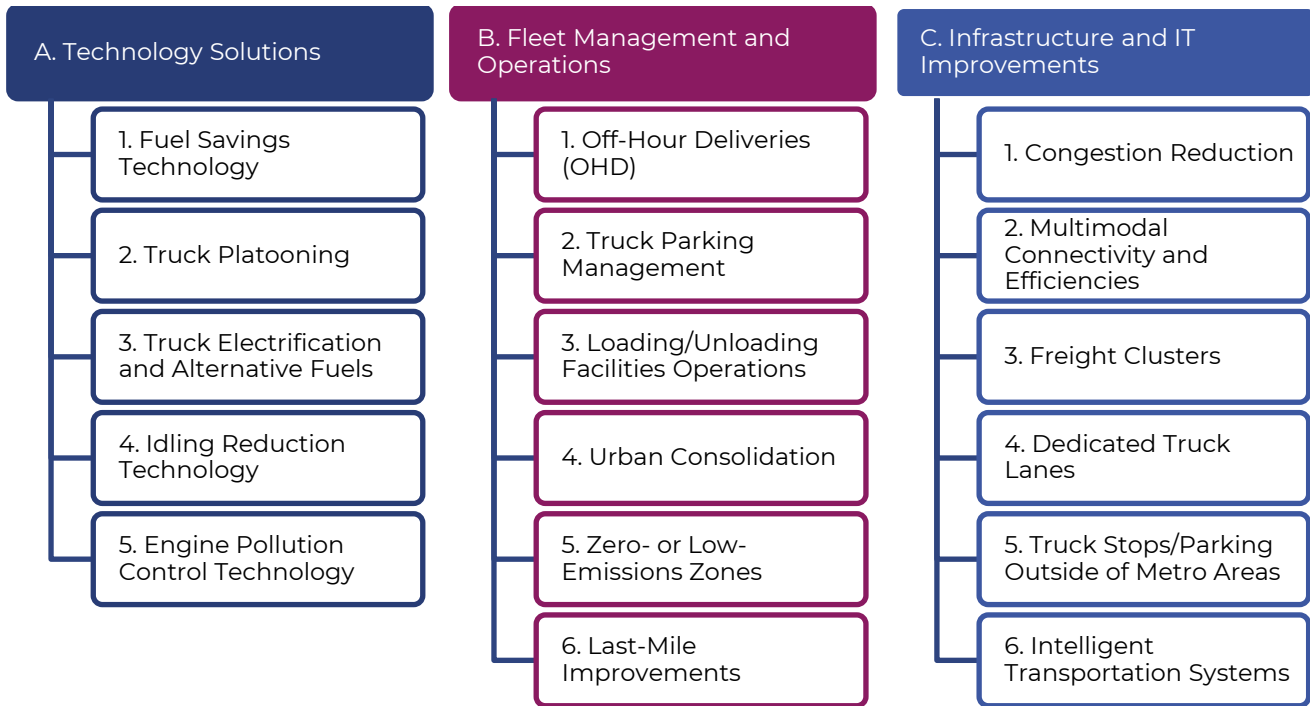


Figure 2 provides a graphic representation of all the categories and technologies/strategies. Section 3 provides a detailed explanation of the policies identified.

Figure 2: Sustainable Freight Best Practices – Categories and Technologies/ Strategies



After identifying a set of Best Practices, a proposed screening framework was developed to assess existing practices. This proposed screening framework will be refined by the project’s Technical Advisory Committee, and then used to determine which existing projects, programs, and policies are in alignment with the vision statement, and which projects, programs, and policies will meet the regional needs and priorities in future tasks. The draft screening framework can be found in Section 5 of this memorandum.

3. REVIEW OF EXISTING PLANS AND STUDIES

An extensive review of existing state, regional and local plans and studies was conducted as part of the Existing Conditions and Best Practices analysis. The following matrix summarizes the relevant documents reviewed.

Document Name	1. Freight Efficiency Strategies: A White Paper Series to Inform the California Sustainable Freight Action Plan (2016)
Summary	<p>A number of stakeholders met with the ultimate goal of identifying inefficiencies faced by the freight system and putting forward a set of strategies to achieve a more efficient freight system. In doing so, a key first step was to provide insight as to the possible root cause(s) of major inefficiencies affecting the system. In addition to assessing inefficiencies, this research describes some of the aspects and necessary conditions that need to be considered when defining or identifying remediating strategies. Moreover, the research discusses several efficiency improvement strategies. These include:</p> <ul style="list-style-type: none"> ▪ Voluntary Off-Hour Delivery Programs ▪ Receiver-led Consolidation ▪ Development of a Chassis Pool of Pools Fully Integrated System ▪ Improvement of Traffic Mitigation Fee Programs ▪ Implement Advanced Appointment/ Reservation Systems ▪ Developing an Integrated System for Dray Operations and Services ▪ Load Matching and Maximizing Capacity <p>In light of the then Governor Jerry Brown’s Executive Order B-32-15 (2015), it is imperative that the various public agencies in the state initiate, continue, or reinforce efforts to address some of these issues.</p>

Document Name **2. Methods for State DOTs to Reduce GHG Emissions from the Transportation Sector (2022)**

Summary As part of the National Cooperative Highway Research Program (NCHRP) objective to evaluate ways to reduce transportation greenhouse gas (GHG) emissions through state department of transportation (DOT) activities and decision-making, this guide document was developed to aid DOTs by breaking down technical and institutional related issues related to GHG estimation and reduction across the spectrum of an agency’s activities. The following table summarizes the key findings:

Observations	State DOT Recommendations
Most emissions reductions will come from clean vehicle and fuel technologies	Support electric and alternative fuel vehicle infrastructure for light and heavy vehicles, clean transit, and clean fleets
Demand reduction and systems efficiency strategies can reduce emissions by up to 5% to 20%	Implement intelligent transportation systems (ITS)/ efficient traffic operations. Invest in and support low-carbon travel alternatives and incentives to manage demand for vehicle travel
DOT construction materials, fuels/fleets, and buildings provide an additional reduction potential of 2% to 3% of total transportation system emissions	Use low-carbon, recycled/reused materials, where feasible. Switch to clean fuel light and heavy vehicles
GHG reduction targets of 75% to 80% or more by 2050 are challenging and will require widespread electrification and a clean grid	Collaborate with other state, regional, and local agencies

Document Name	3. Freight Industry Issues & Trends Memo: Mid-South Freight Flows & Industry Analysis - Memphis Issues and Trends Report (April 2022)
Summary	<p>To fully take advantage of these strengths and opportunities, and shore up weaknesses, the Memphis Urban Area Metropolitan Planning Organization (Memphis MPO) is developing a <i>Mid-South Region Freight Flows & Industry Analysis</i> to develop recommendations for facilitating the growth of freight and logistics industries in the region, including trucking, railroad, air cargo, waterways, pipeline, and warehousing. The <i>Issues and Trends Report</i>, identifies the main issues and trends faced by these freight sectors and assesses their likely impact on the region. This report is organized as follows:</p> <ul style="list-style-type: none"> ▪ Section 2 covers several trends and issues that are likely to affect all freight modes, including: e-commerce, the COVID-19 pandemic, and distributed manufacturing. ▪ Section 3 covers trends and issues in trucking, including: congestion bottlenecks, safety, pavements and structures, parking, electrification, emerging technologies, and driver shortage. ▪ Section 4 covers trends and issues in freight rail, including: network bottlenecks, precision scheduled railroading, intermodal network restructuring, rail technology, bridges and structures, at-grade crossings, and economic development. ▪ Section 5 covers trends and issues in water transportation, including: multimodal access, condition of facilities and assets, industrial land development, container-on-barge growth opportunities (empty and loaded), and industry growth opportunities. ▪ Section 6 covers trends and issues in air cargo, including: cargo trends, parcel industry developments, and accessibility. ▪ Section 7 covers trends and issues in warehousing and distribution, including recent growth, diversification, and use of automation and multi-story technologies. ▪ Section 8 covers trends and issues in pipelines.

Document Name	4. American Transportation Research Institute (ATRI) Trucking Research
Summary	<p>ATRI’s online compendium of <i>Sustainable Freight Practices for the Trucking Industry</i> describes sustainable practices from the trucking industry’s perspective and highlights the positive impacts of, and opportunities for, specific sustainability tools and programs. The various sections of the compendium describe the role truck drivers can play in advancing sustainability, including driving and vehicle operating techniques that can significantly decrease fuel consumption. Also in the compendium are vehicle practices that include a discussion of trends and impacts related to aerodynamics, tires, engines, alternative fuels, cargo management systems, and higher productivity vehicles. The compendium describes the role of the public sector in advancing sustainability in the trucking industry, including congestion mitigation, financial incentives, and government-funded research and development. The three-part series includes:</p> <ul style="list-style-type: none"> ▪ Part 1: The Role of Truck Drivers in Sustainability ▪ Part 2: Sustainable Vehicles Practices ▪ Part 3: Public-Sector Practices

Document Name	5. Sustainability Intervention Mechanisms for Managing Road Freight Transport Externalities: A Systemic Literature Review. (2018) Sustainable Freight Transport, MDPI (2021)
Summary	<p>With road freight transport continuing to dominate global freight transport operations, there is increasing pressure on the freight transport industry and its stakeholders to address concerns over its sustainability. This paper adopts a systematic review to examine the academic literature on road freight transport sustainability between 2001 and 2018. Using content and thematic analysis, this paper identifies and categorizes sustainability intervention mechanisms, providing useful insights on key research applications areas and continental distribution of sustainable road freight transport research. Six overarching sustainability intervention mechanism themes—decoupling, information and communications technology, modality, operations, policy, and other future research—can explore effectiveness of different interventions mechanisms to improve sustainable practices across different continents.</p>

Document Name	6. 2040 Portland Freight Plan – Freight Greenhouse Gas Reduction Best Practices (2022)
Summary	<p>The purpose of this white paper is to provide a concise summary of freight GHG reduction best practices. The urgency is in response to the Governor’s Executive Order 20-04 directing several state agencies to take immediate actions to address climate change, as well as the City of Portland’s climate change goals and commitments, including the recent Climate Emergency Declaration.</p> <p>TOP RECOMMENDATIONS</p> <p>The following is a summary of the top recommendations for reducing GHG emissions from freight. These recommendations are discussed in further detail throughout the report.</p> <p>Technologies</p> <ul style="list-style-type: none"> ▪ Promote the deployment of near-zero and zero-emission trucks—first for urban deliveries and port drayage trips (where operations are more favorable) and then for regional and long-haul trips. Near-zero emission trucks include plug-in hybrid electric vehicles, natural gas vehicles, and liquefied petroleum gas vehicles. The City of Portland can promote these technologies by leveraging funding sources for building charging/refueling infrastructure, working with the private sector to disseminate information technology best practices and experience, developing a pilot project to provide targeted financial assistance, and providing incentives and regulatory exceptions where feasible. Alternatively fueled trucks could serve as a pathway toward full electrification. The City of Portland should consider best practices from neighboring examples, including the Advanced Clean Trucks Program and the New York City Clean Truck Program. ▪ Incentivize use of fuel-saving technologies—such as aerodynamic deflectors and low-rolling resistance tires—through knowledge exchange, financial support, and regulations. ▪ Promote use of idling reduction technologies—such as Auxiliary Power Units (APUs) and electric and AC hookups—by tightening idling regulations, giving preferential treatment to trucks with these capabilities, and leveraging existing funding sources to expand hookup technology at truck parking facilities.

Management and Operations

- Promote off-peak delivery pilots in the central city with interested businesses that will help evaluate the benefits and build and disseminate knowledge about the right locations and conditions for successful implementation.
- Improve the ability of commercial vehicles to find parking, particularly in dense areas, as this avoids commercial vehicles circling/cruising around to find a spot, or parking in a travel lane and causing congestion/safety conflict. This could be achieved through a detailed commercial vehicle parking needs assessment that considers total delivery demand by location and compares it to available curbside delivery zones and off-street truck parking availability. The implementation of a real-time delivery zone reservation system may provide a long-term solution. Additional parking capacity dedicated for commercial vehicles, and the pricing of this capacity, could also help resolve parking availability challenges.
- Implement a Low-Emission Zone (LEZ) in the downtown urban core or pilot a Zero Emissions Delivery Zone,¹ similar to Santa Clara California. Make voluntary, initially, but provide incentives for sustainable technologies and practices. For example, provide priority curb access. Focus attention and investment in area to demonstrate benefits.
- Encourage delivery lockers (Parcel Port, Amazon Locker/Hub) and other consolidation solutions (such as micro hubs) through new residential/commercial building codes, and incentivize placement that is adjacent to high-volume pedestrian locations (such as transit stations).
- Address land use and regulatory impediments that impede the growth in urban consolidation centers that allow freight to be transferred onto vehicles that are better sized for urban delivery. Incentivize charging and refueling capabilities in urban consolidation centers to enable rapid deployment of near-zero and zero-emission trucks in the future.
- Incentivize and address regulatory barriers to the use of cargo bikes in denser urban areas for the first-/last-mile delivery, particularly in dense areas downtown and inner Eastside. Support cargo bike developments with expansion of bike-ped infrastructure.

¹ <https://lincubator.org/zedz/>. Pilot studies have started in several cities in the United States such as Santa Monica. Further information is available at <https://www.santamonica.gov/press/2021/02/25/laci-launches-first-in-nation-zero-emissions-delivery-zone-with-city-of-santa-monica-and-partners-including-nissan-ikea>.

Performance Measures / Monitoring & Evaluation

- Improve the existing GHG emissions inventory for the City of Portland to estimate emissions from different freight sources, ideally providing a breakdown by mode, type of vehicle (i.e., size, year and technology), and geography. This would facilitate the tracking of progress and identification of reduction opportunities.
- Adopt performance measures that are tied to a specific goal/target to measure and quantify the effectiveness of the various implementation measures. The metrics should be documented and shared with the public as a way of being transparent with the community being served. Several measures are proposed later in this report, depending on the types of strategies adopted.
- Quantifying the benefits can help justify the costs for implementing the GHG reduction strategies, and a robust monitoring and evaluation system can help achieve accountability.

Document Name	7. Guide to Deploying Clean Truck Freight Strategies (2017), National Cooperative Highway Research Program (NCHRP)
Relevant Sections	<p>Chapter 2, Clean Truck Strategies</p> <p>Chapter 3, Public-Sector Perspectives</p> <p>Chapter 4, Private-Sector Perspectives</p>
Summary	<p>The report serves as the compilation of the research on clean truck freight strategies, organized in the following categories:</p> <ul style="list-style-type: none"> ▪ Engine and after-treatment technologies – targeting criteria pollutants ▪ Engine and powertrain technologies – targeting fuel efficiency ▪ Alternative fuels ▪ Vehicle technologies – targeting fuel efficiency ▪ Operational strategies ▪ Clean truck corridor infrastructure <p>The researchers completed a literature review that considered more than 50 documents covering more than 45 strategies. For each strategy, the researchers assessed the following information:</p> <ul style="list-style-type: none"> ▪ Segments of the truck population to which the strategy is applicable ▪ Reported fuel and emissions impacts in terms of GHGs, particulate matter, NOx, and volatile organic compounds (VOCs) ▪ Cost (capital and operating) ▪ Current commercial availability or expected timeframe for availability ▪ Examples of deployment <p>Chapter 2 contains a summary of the literature review. Chapter 3 contains a synthesis of the research team’s interviews with public agencies. Chapter 4 shows a synthesis of interviews with the private sector. Chapter 5 shows a brief summary of the stakeholder workshop convened to discuss feedback. Chapter 6 lists case studies developed based on the user pilot testing. Chapter 7 contains a broad overview of the final guide and tool proposed.</p>

Document Name	8. Understanding the CO₂ Impacts of Zero-Emissions Trucks: A Comparative Life-Cycle Analysis of Battery Electric, Hydrogen Fuel Cell and Traditional Diesel Trucks (May 2022). American Transportation Research Institute
Summary	<p>The purpose of this report is to better understand the life-cycle CO₂ emissions of three Class 8 sleeper cab trucks. These trucks are referred to throughout the report as:</p> <ul style="list-style-type: none"> ▪ Internal combustion engine truck ▪ Battery electric vehicle truck ▪ Fuel cell electric vehicle truck <p>The life-cycle stages, described earlier, will be referred to as:</p> <ul style="list-style-type: none"> ▪ Vehicle Production ▪ Energy Production and Consumption ▪ Vehicle Disposal and Recycling <p>The research in this report sets a baseline life-cycle CO₂ calculation for each stage of the internal combustion engine truck, and then compares that internal combustion engine baseline to the two other truck types. The report provides industry, government, and other stakeholders with a technical environmental impact assessment of switching to zero-emission vehicles (ZEVs), as well as a glimpse at the advancements that may be needed to further decrease industry emissions.</p>

Document Name	9. National Academies of Sciences, Engineering, and Medicine 2020. Reducing Fuel Consumption and Greenhouse Gas Emissions of Medium-and Heavy-Duty Vehicles, Phase Two: Final Report (2020)
Summary	<p>Recommendations include:</p> <ul style="list-style-type: none"> ▪ Vehicle Technology: establishing GHG and fuel consumption reduction targets and incentives with the U.S. Environmental Protection Agency ▪ Alternative Technology: waste-heat recovery used in Class 8 and over-the-road vehicles potentially offer significant cost-effective fuel savings ▪ Hybridization ▪ Fuel Consideration ▪ Improved Freight Movement Efficiency

Document Name	10. Deployment of Green Best Practices in Supply Chain Processes (2020)
Summary	<p>Developing practices, processes, and products that have minimal impact on the ecosystem has become a key driver for supply chain management professionals. “Going green” can both lower costs and provide a competitive advantage, yet a majority of firms remain underprepared. This study identified green “best practices” in the supply chain field and investigated the extent to which selected businesses in the northeastern Pennsylvania region are instituting them. Selected companies are pursuing several green best practices and are especially strong in manufacturing activities. However, most practices are, at best, only in the infancy or isolated stages. Opportunities for businesses to more fully integrate their green programs and expand their green projects are discussed.</p>

Document Name	11. State of Art and Practice of Urban Freight Management: Part I: Infrastructure, vehicle-related, and traffic operations (2018)
Summary	<p>The first in a series of two papers, this paper conducts a review of the public-sector initiatives that could be used to improve freight activity in metropolitan areas; collects data about initiatives that been implemented and their performance; and produces a ranking of suggested initiatives. The review of public-sector initiatives is based on a comprehensive analysis of their performance, which catalogued the initiatives into seven major groups, 15 subgroups, and 48 unique initiatives. The initiatives covered in this paper include:</p> <ul style="list-style-type: none"> ▪ Infrastructure management ▪ Parking/loading areas management ▪ Vehicle-related strategies ▪ Traffic management <p>The characterization of the state of the practice and the performance of the initiatives was based on a survey that collected data from 21 countries and 56 cities throughout the world. The third component of the work is a ranking of suggested initiatives based on the performance data collected by the survey. The paper ends with a discussion of chief findings.</p>

Document Name	12. State of the art and practice of urban freight management: Part II: Financial approaches, logistics, and demand management (2018)
Summary	<p>The second in a series of two, this paper conducts a review of the public-sector initiatives that could be used to improve freight activity in metropolitan areas, collects data about the initiatives that have been implemented and their performance, and produce a ranking of suggested initiatives. The review of public-sector initiatives is based on a comprehensive analysis of their performance, which cataloged the initiatives into seven major groups, 15 subgroups, and 48 unique initiatives. The initiatives covered in this paper include:</p> <ul style="list-style-type: none"> ▪ Financial approaches ▪ Logistical management ▪ Demand/land use management <p>The characterization of the state of the practice and the performance of the initiatives was based on a survey that collected data from 21 countries and 56 cities throughout the world. The third component of the work is a ranking of suggested initiatives based on the performance data collected by the survey. The paper ends with a discussion of chief findings.</p>

Document Name	13. City of Toronto Freight and Goods Movement Strategy Literature Review (2019)
Summary	<p>The purpose of the technical and policy document review is to ascertain a thorough understanding of the context and background of this project, to successfully conduct the study and provide a relevant policy document and implementation plan. The review will focus on key freight issues in Toronto, and what makes the city a unique location for freight activity.</p> <p>This paper provides an overview of the existing policy documents and technical reports that relate to and impact goods movement in Toronto. The documents are divided into two different categories:</p> <ol style="list-style-type: none"> 1. Technical documents are those that focus on specific improvements that impact goods movement, such as infrastructure recommendations and other reports commissioned to better understand goods movement in the city. 2. Policy documents are literature that focus on transportation planning and policy, setting up a regulatory environment and policy context for goods movement in the city. These include transportation reports, land use plans, regional freight studies, and international freight studies. A suite of local, regional/provincial, and international policies inform the way transportation has evolved in the city and province, and shape future initiatives and potential investment. This review reveals the emerging key freight issues to better inform the development of the freight and goods movement strategy.
Document Name	14. The Greening of Logistics: Cutting Pollution and Greenhouse Gas Emissions (Global Logistics and Supply Chain Management, 8th Edition (2021)
Summary	<ul style="list-style-type: none"> ▪ Section 1 introduces the framework of logistics and air pollution. ▪ Section 2 discusses specific types of emissions from the logistics sector. ▪ Section 3 discusses the managerial and analytical framework of the logistics sector. ▪ Section 4 addresses the need to repower logistics with cleaner, low-carbon energy. ▪ Section 5 discusses the role of energy efficiency in logistics operations. ▪ Section 6 discusses increasing the utilization of logistics assets. ▪ Section 7 discusses shifting freight to greener transport modes.

	<ul style="list-style-type: none"> Section 8 focuses on reducing the demand for freight movement.
Document Name	15. California Sustainable Freight Action Plan
Relevant Sections	<p>Chapter 1 – California's Freight Transportation System in 2030 and Beyond</p> <p>Chapter 2 – Investing in California's Freight Transport System</p> <p>Chapter 3 – State Agency Actions and Pilot Projects</p> <p>Exhibit D – Pilot Projects</p>
Summary of Relevant Sections	<p>As laid out in then Governor Brown's Executive Order B-32-15 in 2015, California is to transition to a more efficient, more economically competitive, and less polluting freight transport system. To help realize the vision stated in this Executive Order, the California Sustainable Freight Action Plan (CSFAP) is the beginning of a process, and signals state government's interest in collaborating with stakeholders on defining the actions necessary to make vision for a sustainable freight transport system a reality.</p> <p>In Chapter 1, the CSFAP describes current policy drivers in the state and lays out the vision and guiding principles for California's sustainable Freight System, while also providing the following key freight targets:</p> <ul style="list-style-type: none"> Achieve 25% freight system efficiency, relative to the carbon that it produces by 2030. Deploy over 100,000 freight vehicles and equipment capable of zero-emissions operation by 2030. Increase competitiveness and economic growth targets. <p>Chapter 2 discusses potential funding sources for freight and approaches to ongoing freight investments. Appendix G of the report describes in detail the programs under discussion of freight funding programs, including from the FAST Act.</p> <p>Chapter 3 explores in more detail the actions and efforts that can be taken by state agencies and details some pilot projects. The pilot projects are used to demonstrate on the ground progress toward sustainable freight and hope to serve as launching points for much broader application. Agencies including Caltrans, ARB, Energy Commission and the Governor's Office of Business and Economic Development are participants in these pilot projects. As summarized in Appendix D, the pilot projects include:</p> <ul style="list-style-type: none"> Dairy biomethane for freight vehicles (San Joaquin Valley)

- Advanced technology for truck corridor (Southern California, Interstates 710, 10, 15 and State Route 60)
- Advanced Technology Corridors at Border Ports of Entry (California-Mexico Border, Otay Mesa)

Furthermore, Appendix F of this document details the Freight Efficiency Working Group Papers, including abstract for the following papers:

- Topic #1: Funding for Freight Infrastructure and Clean Equipment
- Topic #2: Strategies to Maximize Asset Utilization in the California Freight System: Part 1 – Background and General Recommendations
- Topic #3: Strategies to Maximize Asset Utilization in the California Freight System: Part 1 – Strategies
- Topic #4: Planning and Policy
- Topic #5: Operational Modernization at Distribution Nodes
- Topic #6: Information Technology

Document Name	16. California Division of Research, Innovation and System Information (DRISI) Research Reports
Document Summary	DRISI manages a comprehensive research portfolio to address research and operational needs across Caltrans. Out of the series of white papers and reports, the following two white papers were reviewed based on their relevance to sustainable freight.
Relevant Sections	<ul style="list-style-type: none"> ▪ Freight Efficiency Strategies: A White Paper Series to Inform the California Sustainable Freight Action Plan (Giuliano et al., 2016) ▪ Solar Power Initiative Using Caltrans Right-of-Way Final Research Report (Kurtz et al., 2020)
Summary of Relevant Sections	<p>The Freight Efficiency Strategies white paper seeks to identify a set of potential strategies that could improve California’s freight system performance and efficiency. The white paper focuses on those strategies aimed at maximizing asset utilization by fostering collaborative logistics practices and/or freight demand management. Moreover, the research discusses a number of efficiency improvement strategies, including:</p> <ul style="list-style-type: none"> ▪ Voluntary off-hour delivery programs ▪ Receiver-led consolidation ▪ Development of a chassis pool of pools fully integrated system ▪ Improvement of traffic mitigation fee programs ▪ Implement advanced appointment/ reservation systems ▪ Developing an integrated system for dray operations and services ▪ Load matching and maximizing capacity <p>The Solar Power Initiative report provides guidance to Caltrans on the installation of utility-scale solar electrical generation facilities in its right-of-way. It explores the current rules, regulations, and policies from regulatory agencies external to Caltrans and California utilities that affect Caltrans’ ability to install solar within its right-of-way. The report determines best practices that other state DOTs have developed based on their experience with the deployment of solar generation facilities within their rights-of-way. The report outlines best practices of how to develop solar generation sites within Caltrans right-of-way and summarizes design-build-own strategies that Caltrans could use as part of a public-private-partnership (P3) to finance the installation and/or maintenance of solar sites within the Caltrans right-of-way.</p>

Document Name	17. SANDAG 2021 Regional Plan
Document Summary	<p>The 2021 Regional Plan builds upon the previous plan and provides new updates since the earlier iteration of the reports. The 2021 Regional Plan is a long-term blueprint for the San Diego region that seeks to meet regulatory requirements, address traffic congestion, and create equal access to jobs, education, healthcare, and other resources. The plan is the result of years of planning, data analysis, and community engagement in the San Diego region with a transformative transportation system, a sustainable pattern of growth, and innovative demand and management strategies.</p>
Relevant Sections	<p>Chapter 1 – A Bold New Vision for the 2021 Regional Plan lays out the current key challenges and opportunities.</p> <p>Chapter 2 – Sustainable Communities Strategy (SCS) describes the Regional Plan SCS – the package of projects, policies, land use strategies, and programs that will achieve the state Vision and Goals.</p> <p>Chapter 3 – Paying for the Regional Plan, Forming Partnerships and Taking Action, and Monitoring How the Plan Performs describes the planning, investments, actions and partnerships needed to implement the 2021 RP, and the metrics that will be used to monitor implementation and performance over time.</p> <p>Appendix A – Transportation Projects, Programs, and Phasing (i.e., Page A-72 “Unconstrained Goods Movement Projects; Page A-78 “Figure A.15: Unconstrained Goods Movement Network”)</p> <p>Appendix Y – Goods Movement Planning and 2021 San Diego and Imperial Counties Freight Gateway Study</p>
Summary of Relevant Sections	<p>Chapter 1 summarizes the key state goals, policies and Executive Orders considered in the 2021 Regional Plan:</p> <ul style="list-style-type: none"> ▪ SB 375 and SCS Program and Evaluation Guidelines (2019) ▪ California Assembly Bill 805 ▪ 2017 Regional Transportation Plan ▪ California Transportation Plan 2050 (2021) ▪ Climate Action Plan for Transportation Infrastructure (2021) ▪ California Assembly Bill 617 (2017); Community Air Protection Program ▪ California State Assembly Bill 32 (2016); Reduce GHG Emissions by 40% below 1990 levels by 2030

- Executive Order (EO) B-55-18; EO S-3-05; EO N-79-20; and EO N-82-20

Under Chapter 2, the 2021 Regional Plan describes the “5 Big Moves” for a reimaged transportation system, including:

1. Complete Corridors
2. Transit Leap
3. Mobility Hubs
4. Flexible Fleets
5. Next Operating System (Next OS)

These plans emphasize improving Goods Movement to support sustainable, innovative strategies that foster trade and reduce freight-related GHG emissions and air pollution. These include:

- **Improving roadways** that improve the region’s local, regional, interregional and international movement, such as through Managed Lanes, bottleneck improvements, priority signals for trucks, measuring border wait times, additional dynamic truck parking, near-zero/zero-emission infrastructure, and critical bridges.
- **Border system improvements** to existing regional land ports of entry and providing reliable crossing times to commercial and passenger vehicles through variable tolling.
- **Railroad improvement** through Transit Leap initiatives, including track reconfigurations, bridge replacements, grade separations, and rehabilitation projects. There is specific mention of completing the last double-tracking projects along the Los Angeles – San Diego – San Louis Obispo (LOSSAN) Rail Corridor, which will provide additional rail capacity for freight operators, potential shifting some interregional truck trips to rail moves.
- **Air Cargo System Improvements** – San Diego County Regional Airport Authority improvements to cargo storage and handling facilities will support the movement of high-value and time-sensitive goods.
- **Maritime System Improvements** that would optimize maritime operations, reducing emissions, and facilitate truck and rail access.
- **Next OS** digital network that will support drivers picking goods up and delivering goods to businesses and residents. Truck routing and permitting information, truck parking availability, and border wait time data will be some of the applications found within the Next OS.

Appendix Y lists several specific projects worthy of note:

- **SR 11/ Otay Mesa East Port of Entry (POE)** – This project involves development of a new multimodal land POE in close coordination with Mexico’s future Mesa de Otay II POE. Using variable tolls to manage traffic demand for commercial and passenger vehicles, the POE will provide a new relief valve, resulting in decreased congestion and wait times at the other San Diego land POEs.
- **Near-Zero/Zero-Emission Truck and Freight Signal Priority Pilot** – The San Diego Port Tenants Association, through a California Energy Commission grant, recently transition some of their fleet to near-zero/zero emissions vehicles and implemented a freight signal prioritization (FSP) pilot project along Harbor Drive. Note that as of 2022, the pilot is now complete and is undergoing evaluation to become a permanent fixture as part of Harbor Drive 2.0.
- **Harbor Drive 2.0 Project** – Port of San Diego, SANDAG, U.S. Navy, and Caltrans District 11 are working to expand the FSP pilot project into a larger intelligent transportation system project along Harbor Drive that will provide greater efficiency for trucks and other multimodal users of San Diego’s Working Waterfront. These partners are working with the AB 617 Portside Community Steering Committee to identify strategies to reduce truck-related impacts and improve air quality in the surrounding Portside Environmental Justice Neighborhoods.

For more information, refer to the 2021 San Diego and Imperial County Freight Gateway Update Study (Appendix Y2).

Document Name	18. Community Emission Reduction Plan – Portside Environmental Justice Neighborhoods
Document Summary	<p>In response to Assembly Bill 617 (AB 617) in 2017, the California Air Resources Board (CARB) established the Community Air Protection Program. Part of that program, the Community Emissions Reduction Plan details information and strategies intended to reduce both air pollution emissions and community exposure to air pollution in the Community of Portside Environmental Justice Neighborhoods.</p> <ul style="list-style-type: none"> ▪ Chapter 1 describes the community and context of this effort. ▪ Chapter 2 details the role community outreach and engagement plays in achieving the success of AB 617 initiatives. ▪ Chapter 3 reviews the existing pollutant data. ▪ Chapter 4 delves deeper into the monitoring mechanisms and efforts taken to date. ▪ Chapter 5 and 6 describe the enforcement of existing air quality laws and regulations. ▪ Chapter 7 focuses on the actions and strategies of the Community Emissions Reduction Plan.

Document Name	19. SCAG Curb Management Study
Document Summary	<p>The primary purpose of the Curb Space Management Study is to take a comprehensive and multimodal review of some of the most congested and complicated curb space locations within the SCAG region. Specifically, the Curb Space Management Study will work closely with the cities of Anaheim, Riverside, Santa Ana, and Santa Monica, as well as more broadly across the SCAG region through the identification of interest and willingness to develop curb-related elements. The study commenced in August 2021 and is expected to be completed by June 2022.</p>
Summary of Relevant Sections	<p>Core Objectives of the study include:</p> <ul style="list-style-type: none"> ▪ Provide various strategies and recommendations for multiple cities within the SCAG region. ▪ Develop a work plan for multiple pilot project concepts and/or analysis plans for pilot projects currently underway. <p>The Curb Space Management Study concurrently has the following goals and objectives for consideration:</p> <ul style="list-style-type: none"> ▪ Reduce vehicle-miles traveled (VMT)/vehicle-hours traveled (VHT) and GHG emissions. There are multiple opportunities to reduce VMT/VHT and GHG emissions at the first- and last-mile levels. ▪ Reduce congestion. By taking a comprehensive and multimodal approach within complicated curb space areas, the study will consider optimal strategies managing demand and reducing congestion. ▪ Promote a balanced transportation system by better understanding first- and last-mile relationships between transportation network companies (TNCs) and existing transit and active transportation systems. ▪ Establish key collaboration and partnerships with public agency and private-sector stakeholders. ▪ Improve quality of life.

Document Name	20. California Statewide Truck Parking Study
Document Summary	<p>The California Statewide Truck Parking Study (CSTPS) identified statewide unmet demand for truck parking and existing truck parking challenges and recommendations for mitigating challenges. As part of that effort, it identified truck parking design guidelines, considered the feasibility for zero emissions fueling at truck parking lots, and developed a public-private partnership action plan for identifying and funding facilities. It also developed an implementation plan, including funding strategies.</p> <p>The CSTPS generated the <i>Truck Parking Design Guidelines</i> report (<i>Guidelines</i>), which is focused on establishing criteria and guidance for the siting, planning, and design of truck parking areas for use by truck drivers wishing to park in a secure setting off public roads.</p> <p>It covered:</p> <ul style="list-style-type: none"> ▪ Design Goals ▪ Existing Standards ▪ Design Vehicles ▪ Parking Stall Dimensions ▪ Services and Service Facilities ▪ Logistics, Geography, and Access ▪ Site Layout Examples
Summary of Relevant Sections	<p>Truck Parking Feasibility Guide Supplement – District 11 Site Assessment: One element of the <i>Guidelines</i> involved testing of the site selection and design criteria on sites in Caltrans District 11. Examination of Caltrans and other publicly owned properties across District 11 identified seven sites that might be feasible, and which were used as examples in the <i>Guidelines</i>. In the <i>Guidelines</i>, the “Site Layout Examples” section established a possible parking layout for each Example Site. Because the purpose of that document was not to propose specific sites for development, locational details were not included in the <i>Guidelines</i>.</p>

4. SUMMARY OF BEST PRACTICES REVIEW

A review of state, national, and international best practices in sustainable freight was conducted. The results have been organized into 3 key categories and 17 technologies/strategies relevant to the study area that encompass the San Diego and Imperial Counties region. The matrix describes the relevant policies and provides examples, along with the relevant studies and reports from which they were derived.

Category	Policies/ Interventions	Examples and Past Experiences
<p>A. Technology Solutions:</p> <p>1. Fuel Savings Technologies</p>	<p>Several off-the-shelf technologies exist that trucks can implement to improve fuel economy and reduce greenhouse gas emissions.² These include:</p> <ul style="list-style-type: none"> ▪ Aerodynamic deflectors on the cab and trailer (including trailed side skirts and tail flaps) ▪ Low-rolling resistance tires ▪ Low-viscosity lubricants, and many more <p>Research has found that many of these technologies are cost effective and can pay for themselves in just a couple of years from reduced fuel consumption.^{3,4} Currently, the trucking sector underinvests in these technologies; however, several states and localities are introducing regulations mandating or incentivizing their adoption. Examples include regulations introduced by the CARB mandating the use of certain aerodynamic deflectors and tires, and the voluntary SmartWay Program of the U.S. Environmental Protection Agency (EPA), which certifies fleets that use these technologies. Opportunities exist for the study area/San Diego region to work with the private sector to disseminate</p>	<ul style="list-style-type: none"> ▪ California Tractor-Trailer GHG Regulation (2008) has been successfully implemented, reducing fuel consumption by 5% to 10%, generally leading to a positive return-on-investment for carriers.

² 2040 Portland Freight Plan – Freight Greenhouse Gas Reduction Best Practices (2022)

³ <https://www.sciencedirect.com/science/article/abs/pii/S1366554513001452>

⁴ National Cooperative Highway Research Program (NCHRP) Report 862 - Guide to Deploying Clean Truck Freight Strategies. Chapter 2 Clean Truck Strategies

	<p>information on urban freight technologies and benefits and establish a peer knowledge exchange similar to the EPA’s SmartWay program, develop pilot projects to provide financial assistance in the acquisition of fuel saving technologies that go beyond statewide mandates, and/or provide incentives or regulatory exceptions for trucks that include specific fuel saving technologies.</p>	
<p>A. Technology Solutions:</p> <p>2. Truck Platooning</p>	<p>Truck platooning uses driver assistive technologies to allow two or more trucks to wirelessly share data in order to closely follow a lead truck. These technologies allow the trucks to drive very close together, which significantly decreases aerodynamic drag and improves fuel efficiency. Several truck platooning feasibility studies have been completed over the past decades. Widespread implementation is still uncertain, however. Truck platooning pilots are best conducted for intercity travel, involving multiple agencies and jurisdictions.</p>	<ul style="list-style-type: none"> ▪ Auburn University and American Transportation Research Institute research found up to 10% fuel economy for the trailing truck and up to 5% improvement for the leading truck.⁵ ▪ By using methods such as truck platooning, lane capacity may be increased by 65% to 100%. ▪ A project at Aachen University in Germany successfully operated a platoon of four trucks spaced at 33-foot intervals and research at UC Berkely successfully operated several three-truck caravans at approximately 14-foot intervals.

⁵ American Transportation Research Institute, Part 3 – Public Sector Practices. <https://truckingresearch.org/sustainable-public-sector-practices/>

		<ul style="list-style-type: none"> Technology solutions such as TuSimple Autonomous Freight Network (AFN), truck fleets are able to maximize efficiency, reliability and sustainability. AFN is deployed across six major cities across Arizona and Texas.⁶
<p>A. Technology Solutions</p> <p>3. Truck Electrification and Alternative Fuels</p>	<p>Government agencies across the country are taking steps to accelerate the electrification of the truck fleet, and related cargo-handling equipment (such as forklifts and cranes). Some of the key initiatives in California⁷ include:</p> <p>California’s Advanced Clean Truck Regulation approved new rules in June 2020 that require a certain percentage of trucks sold each year to be of ZEVs, at an increasing percentage from 2024 to 2035, with the goal of reaching 75% of Class 4 through 8 straight trucks and 40% of tractor trailers. This regulation also requires large fleet owners to provide information about their operations to inform future rulemaking. This initiative taking place in California is expected to have a significant impact on the electric truck market nationwide, given the size of the California trucking market.</p> <ul style="list-style-type: none"> California Executive Order N-79-20 sets the goal that all drayage trucks shall be ZEVs by 2035, and all medium- and heavy-duty vehicles shall be ZEVs by 2045.) 	<ul style="list-style-type: none"> Significant investment, research, and testing are underway throughout the country, especially in California, to accelerate truck electrification. Approximately 100 electric trucks are being deployed/tested at the Ports of Long Beach and Los Angeles. This includes the construction of chargers. The New York Clean Trucks Program provides incentives for replacing diesel trucks with electric trucks, with a goal of reaching 4,000 electric trucks by 2025 from 2,100 in 2020.

⁶ TuSimple. <https://www.tusimple.com/>

⁷ SANDAG. Appendix Y – Goods Movement Planning and 2021 San Diego and Imperial Counties Freight Gateway Study

- California's Low-Carbon Fuel Standard generates millions in credits each year and reached over \$2 billion in transactions in 2019.

Agencies have also been exploring use of alternative fuels that are less GHG intensive. The Ports of Long Beach and Los Angeles have increased the use of cleaner diesel and natural gas trucks. The two ports have also advanced zero-emission truck technologies (electric and hydrogen fuel cell) through their Technology Advancement Program, which provides funding in partnership with CARB for pilot projects. In support of both natural gas and hydrogen fuel cell deployments, the ports have also been investing in the fueling infrastructure.

There are three critical factors for industry when deciding to invest in these new technologies: 1) cost, 2) reliability and travel range, and 3) fueling infrastructure.

The fueling and recharging network is a critical piece that public agencies can affect.

California's policies have helped advance charging infrastructure. For example, in California, major public utilities providers have been engaged in assessing future demand, identifying deficiencies in the electricity grid, and developing future improvements to meet anticipated demand. Several funding assistance programs have been developed in California to facilitate the acquisition of electric heavy- and medium-duty vehicles and development of electric-charging technology.

- In early 2019, Penske Truck Leasing opened the nation's first Direct Current (DC) fast-charging stations (14 total, with 6 more planned) at four locations in Southern California designed specifically for heavy-duty commercial electric vehicles. Utilizing 50kW to 150 kW chargers, the stations can fully charge an all-electric Class 8 tractor in less than half a shift (or 7 hours, assuming a maximum daily 14-hour shift).

A. Technology Solutions:

4. Idling Reduction Technologies

Trucks frequently idle for extensive periods of time, generating significant emissions of criteria pollutants and greenhouse gases. Phase 2 of the joint EPA and U.S. Department of Transportation (USDOT) National Highway Traffic Safety Administration developed the Heavy-Duty Greenhouse Gas rule for original equipment manufacturers with respect to idle reduction requirements. This rule requires idle reduction technology, such as Auxiliary Power Units (APUs) for model year 2021 new Class 7 and Class 8 trucks with sleeper cabs, among other improvements to truck fuel efficiency.⁸ The EPA's voluntary SmartWay program has been encouraging the use of anti-idling technologies for over a decade. There are two main types of APUs: diesel-powered and battery-electric. Therefore, to ensure the maximum GHG reduction benefits, battery-electric APUs should be encouraged. Parking spots can also be retrofitted with electrical hookups, including HVAC hookups that eliminate the need for idling.⁹

Entities within the region can work together and go beyond existing rules by:

- Leverage local, state, and federal funding to build-out anti-idling technologies such as electrical and air conditioning hookups, at new and existing parking facilities.

— Simulator (MOVES 3), the use of APUs for extended idling is projected to reach 40% by 2021, 50% by 2024, and 55% by 2030.

— The Utah Inland Port Authority recently applied for Congestion Mitigation and Air Quality (CMAQ) funding for a new (publicly owned and operated) plug-in, truck parking facility in the inland port. The facility would include charging infrastructure for trucks to plug-in, provide power, and help avoid overnight idling on neighboring streets by 2027.¹¹

⁸ <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100P7NL.PDF?Dockey=P100P7NL.PDF>

⁹ 2040 Portland Freight Plan – Freight Greenhouse Gas Reduction Best Practices (2022)

¹¹ <https://inlandportauthority.utah.gov/truck-parking-solutions/>

	<ul style="list-style-type: none"> ▪ Lobby state agencies to allow for reduced vehicle registration fees and operating licenses for trucks equipped with battery-electric APUs. ▪ Tighten anti-idling laws and enforcement in certain areas of the city, such as residential areas. ▪ San Diego local and regional authorities can work together to restrict truck access to public facilities, including parking lots, to vehicles equipped with APUs only. While potentially useful, this could have the unintended side effect of increase the frequency of undesignated parking and making it harder for trucks to abide by Hours of Service regulations. <p>CARB has developed idling regulation for locomotives and railyard emissions that are set to be introduced in 2023.¹⁰</p>	
<p>A. Technology Solutions:</p> <p>5. Engine Pollution Control Technologies</p>	<p>These strategies focus on reducing criteria pollutant emissions (primarily NO_x or particulate matter) from trucks. They include exhaust retrofit devices such as diesel oxidation catalyst (DOCs) and diesel particulate filters (DPFs). With the introduction of trucks that comply with the EPA model year (MY) 2007/2010 emission standards, exhaust retrofits are now appropriate only for older trucks. Some potential configurations¹² include:</p>	<ul style="list-style-type: none"> ▪ September 2020, CARB provided funding to replace older trucks with outdated emission control features for newer, cleaner models in the San Diego region¹³. This effort is part of CARB’s long-term efforts in the Truck and Bus Regulation program.¹⁴

¹⁰ “Evaluation and Potential Development of Regulations to Reduce Emissions from Locomotives,” CARB, March 2018, arb.ca.gov/resources/documents/evaluation-and-potential-development-regulations-reduce-emissions-locomotives.

¹² National Cooperative Highway Research Program (NCHRP) Report 862 - Guide to Deploying Clean Truck Freight Strategies. Chapter 2 Clean Truck Strategies

¹³ “Clean Air For All: Moyer/FARMER/CAPP Grants,” SDAPCD, August 19, 2021, sdapcd.org/content/sdc/apcd/en/grants-and-incentives/carl-moyer-program.html.

¹⁴ Bus and Regulation Program, CARB. <https://ww2.arb.ca.gov/our-work/programs/truck-and-bus-regulation>.

- A Diesel Oxidation Catalyst is an after-treatment device that reduces carbon monoxide, hydrocarbons, and the organic carbon component of particulate matter. Diesel Oxidation Catalysts have limited particulate matter benefits and do not reduce NO_x. They are only appropriate for older (pre-2007) trucks.
- A DPF is an after-treatment device that captures particulate matter from the exhaust gas flow. DPFs do not reduce NO_x. They are only appropriate for pre-2007 trucks.
- Replacing older diesel trucks with newer (2010+) diesel models can significantly reduce particulate matter and NO_x emissions. Incentives to replace older vehicles with cleaner alternatives can accelerate the retirement of trucks not meeting 2007/2010 emission standards.
- Ocean-Going Vessel Fuel Regulation was established in 2009 and requires the use of marine distillate grade fuel (marine gas oil or marine diesel oil) with a maximum sulfur level of 0.1% while operating auxiliary diesel and diesel-electric engines, main propulsion diesel engines, and auxiliary boilers on ocean-going vessels within Regulated California Waters (all waters within 24 nautical).¹⁵
- CARB has developed and implemented measures aimed at reducing locomotive and railyard emissions in California. These measures are focused on limiting idling of combustion-powered vehicles and mobile equipment and reducing emissions resulting from stationary locomotive operations. The implementation and impacts of these measures and regulations are anticipated to begin in 2023.¹⁶

¹⁵ SANDAG Appendix Y: Goods Movement Planning and 2021 San Diego and Imperial Counties Freight Gateway Study Update

¹⁶ SANDAG Appendix Y: Goods Movement Planning and 2021 San Diego and Imperial Counties Freight Gateway Study Update

		<ul style="list-style-type: none"> Port of San Diego has deployed a Bonnet System that helps further reduce cargo vessel emissions on and around San Diego Bay, including a Marine Exhaust Treatment System that is certified by CARB.¹⁷
<p>B. Fleet Management and Operations:</p> <p>1. Off-Hour Deliveries (OHDs) – Freight Demand Management</p>	<p>Off-hour deliveries (OHDs) or off-peak deliveries (OPD), typically defined as being between 7:00 p.m. and 6:00 a.m., are an effective tool for managing freight demand. By improving traffic flow, OHD can reduce emissions and reduce conflict between commercial vehicles, general traffic, and vulnerable road users.</p> <p>OPDs encompass many strategies to shift truck trips to hours of the day when the city is less congested, better utilizing roadway and parking infrastructure. Often this involves shifting trucks to operate at night; however, it could also include operating between the peak times of the day. The ability for companies to partake in OPD depends on their specific circumstances. For some, the costs of having staff present after-hours, or the cost of installing surveillance equipment in lieu of staff, could greatly outweigh the benefit of faster and more reliable deliveries. Companies could also have specific operations that require deliveries at certain times of the day, such as bakeries. Another common</p>	<p>New York’s original Off-Hour Truck Delivery (OHD) Pilot¹⁸ program ran from 2009 to 2010, funded by USDOT, and led by Rensselaer Polytechnic Institute with a goal of demonstrating feasibility and benefits of OHDs while reducing truck traffic during periods of highest congestion. USDOT was the lead coordinating agency for the pilot and worked with trucking industry representatives, New York State Department of Transportation, Port Authority of New York and New Jersey, and New York Metropolitan Transportation Council to develop an approach and address concerns of carriers and receivers regarding the shift to OHD. The New York City OHD program was subsequently expanded by New York City Department of Transportation to include 400+ partnerships with</p>

¹⁷ Port of San Diego, *Port of San Diego to Deploy Bonnet System to Help Further Reduce Cargo Vessel Emissions on and around San Diego Bay*. May 19, 2022. [Port of San Diego to Deploy Bonnet System to Help Further Reduce Cargo Vessel Emissions on and around San Diego Bay | Port of San Diego](#)

¹⁸ Off-Hour Deliveries Program, New York City DOT. <https://ohdnyc.com/sites/default/files/business-admin-files/Home/ohd-final-report.pdf> and <https://ohdnyc.com/benefits>.

impediment are buildings that do not allow night-time deliveries or are configured in a way that make these deliveries difficult.

The type of OPD that works best in practice depends on the relationship between the carrier and the receiver, the type of goods involved, the size of the shipment, and the technology available. The economics of OPD largely favors establishments that attract significant amounts of freight, such as hospitals, malls, and universities. This way the fixed costs of receiving deliveries at night, from having staff present or installing a surveillance system, are diluted over more deliveries. Unassisted OPD is easier to implement when the carrier and the receiver work for the same company or there is a high degree of trust between them (Sanchez-Diaz et al. 2016).

commercial establishments in New York City to accept OHD without supervision.

- An OHD pilot was recently implemented in the Toronto area, finding that these programs have the ability to significantly reduce freight delay and GHG emissions.¹⁹
- Transport for London created an office for “Retiming of Deliveries” to foster receivers to accept OHD, or to stagger their deliveries and reduce freight traffic in the peak hours.²⁰

¹⁹ <https://journals.sagepub.com/doi/full/10.1177/03611981221089552>

²⁰ <https://www.sciencedirect.com/science/article/abs/pii/S0965856418301277>

B. Fleet Management and Operations:

2. Truck Parking Management

Improvements in the ability of commercial vehicles to find parking, particularly in dense areas, could potentially yield significant GHG reduction benefits. Increased availability of commercial vehicle parking where needed avoids commercial vehicles circling/cruising around to find a spot, or parking in a travel lane and causing congestion/safety conflicts. Setting up designated freight parking and loading zones is another solution. These programs focus on allocating curb space for parking and loading activities at a fee. Ideally, loading zones of at least 100 feet are located in the middle of the block on the shoulder lane to keep the traffic delay to a minimum.²¹ Increasing the capacity of parking and loading areas is an obvious and low-cost way to reduce congestion and improve traffic.²²

Several ways to managing loading/unloading facilities operations are being considered. They include:

- Use of pricing tools (e.g., dynamic pricing) to manage demand, as well as increase parking capacity dedicated for commercial vehicles and load/unload operations)
- Building/curbside level designs to ensure quick, efficient, limited impacts on traffic streams
- Potential consolidation of receiving areas (e.g., urban consolidation)
- Strict enforcement of illegal parking

- Initiative undertaken by the New York City Department of Transportation, which increased the parking allocation for commercial vehicles and installed parking meters (New York City Department of Transportation 2012, The City of New York 2012). The freight industry reacted very positively to the new policy. However, since the parking spaces are also available to other service vehicles, the carriers do not fully or exclusively benefit from the policy.
- The Washington, DC, curbside freight study recommends providing longer parking/loading spaces, multi-space meters, and the pricing of loading zones.²⁵
- A pilot was started recently in Washington, DC, that allows trucks to reserve curbside space for free in selected locations. Reducing the time

²¹ <https://trid.trb.org/view/1485324>

²² Nourinejad, M., Wenneman, A., Nurul Habib, K., Roorda, M. (2014). Truck parking in urban areas: application of choice modelling within traffic microsimulation. *Transportation Research Part A* 64, pp. 54–64.

²⁵ Jones E., Chatterjee, A., Marsili, R. (2009). A collaborative plan for curbside freight delivery in Washington D.C. *ITE J* 79(5), pp. 22–25.

Steps could also be taken at the building/curbside level to ensure that commercial parking operations are quick, efficient, and limit impact on the traffic stream. Most buildings and businesses accept deliveries daily. Although some businesses offer off-street loading bays, most depend on the provision of load/unload space at the curb to receive their goods. Parked and double-parked trucks are a major contributor to urban congestion and the obstruction of pedestrian infrastructure, along with truck and delivery vans idling and emitting pollutants and GHGs. NCHRP Report 844 recommends regulations forcing new developments to adequately consider truck parking needs.²³ This could include constructing enough loading bays to satisfy the existing and future needs of tenants, and even designating alleyways or flexible spaces that trucks can use during certain times of the day. Over time, this would reduce the need for commercial curbside parking, which would reduce conflicts with other modes, improve safety, and enhance the aesthetics of the city. The Institute of Transportation Engineers published a technical resource guide²⁴ that could also help efficiently manage the curb for loading/unloading operations. The guide considers regulatory, operations, and technology strategies to optimize curb access and usage, and features case studies for quick reference.

spent parking, through a graduated fee schedule for example, could also decrease parking needs.²⁶

- San Francisco and Calgary implemented dynamic truck parking pricing that varies throughout the day to maintain availability.
- Los Angeles “Tiger Teams” strict enforcement of truck parking regulations.²⁷
- On main boulevard in Barcelona, certain lanes were designed for residential parking at night, commercial delivery parking off-peak, and through traffic during the peak.

²³ <https://www.trb.org/Main/Blurbs/175482.aspx>

²⁴ <https://www.ite.org/technical-resources/topics/complete-streets/curbside-management-resources/>

²⁶ <https://trid.trb.org/view/1562320>

²⁷ <https://ops.fhwa.dot.gov/publications/fhwahop10020/tigerteams.htm>

B. Fleet Management and Operations:

3. Urban Consolidation and Mobility Hubs

The objective of urban consolidation is to decrease the number of trucks needed to serve an urban area by combining pickups and deliveries. Consolidation can also allow freight to be transloaded onto vehicles that are smaller, cleaner, and more appropriate for travel in dense downtown areas. The two predominant types of consolidation schemes are consolidation centers that serve a single, large freight generator, and consolidation centers that serve many establishments in a region. The former has been used to serve airports or other self-contained destinations with many retail establishments, while the latter have been used primarily in dense historic European cities to reduce the footprint of urban supply chains. The consolidation centers can be operated publicly or privately, and they can receive different levels of financial support from the public sector.

The main benefits of consolidation centers have been described²⁸ as:

- Potentially reduce truck VMT by increasing payloads
- Reduce emissions by shifting cargo to cleaner trucks
- Facilitate night deliveries by centralizing staffing and surveillance
- Reduce parking requirements, particularly during peak hours of the day
- Allow deliveries in narrow historic districts
- Reduce number of distinct deliveries

- The most successful consolidation centers are those that are operated by an organization that can strongly influence carriers and receivers, which is often the case when there is one property owner or developer involved. This is the case with the Heathrow Airport Consolidation Center, which serves over 300 airport tenants (mandatory) and is operated by DHL.
- Consolidation centers are much more common in Europe, where certain types of commercial vehicles are prohibited from operating in historic areas.

²⁸ <https://www.sciendo.com/article/10.1515/tjt-2016-0021>

- Provide value added services, such as off-site stockholding, pre-retailing activities such as unpacking, ticketing, and handling returns; waste recycling, or customer collection services

While urban consolidation has been successful in some instances, it has failed in many others because:

- Increased handling costs can offset transportation costs
- Diffusion of responsibility and loss of control over delivery
- Increased risk of damage from added handling
- Difficulties in chasing lost deliveries
- High set up costs/fixed costs
- Could increase emissions if cargo is transferred from large trucks to many smaller ones that are not exceptionally cleaner

The strategies that agencies can implement to facilitate urban consolidation that is sustainable depend on the local context. In Europe, public agencies have been extensively involved in the development and operation of consolidation centers, primarily as a way of transferring freight onto vehicles that can better navigate dense historic neighborhoods and meet local regulations (such as low-emission zones). In the United States, with lower levels of government involvement and subsidy, these types of approaches are unworkable. Therefore, SANDAG and ICTC are best served by introducing incentives or tweaking regulations to facilitate the type of sustainable urban consolidation

- Border Mobility Hubs represent another opportunity to ensure that trucks and small package carriers are properly accommodated with parking, queueing, separate spaces for vans and larger trucks, or other types of hub accommodations (e.g., accommodations similar to those provided by Amazon hubs).

	<p>that will reduce emissions. This could include reviewing land use regulations and making it easier to locate consolidation facilities closer to customers. Additionally, incentives could be provided for new consolidation developments that facilitate green technologies, such as electric truck recharging. Consolidation might be required to meet California's truck electrification goals.</p>	
<p>B. Fleet Management and Operations:</p> <p>5. Zero or Low-Emission Zones</p>	<p>Zero- or Low-Emission Zones (ZEE/LEZ) are another proven tool available to agencies that could directly influence the vehicle fleet composition on public roadways. In London, for example, clean air was a top priority/agenda for the mayor and public, because of the growing body of evidence that linked poor air quality with negative health outcomes; especially for children. The LEZ concept puts immediate pressure on high polluting, heavy trucks to upgrade their fleets more quickly (in addition to passenger vehicles). However, it can also be a burden on the industry and result in negative economic impacts to certain geographic areas if it is not strategically implemented. In addition, caution must be taken when designing the cordon area (including its size) to avoid vehicles attempting to bypass the LEZ by cutting through neighborhoods or taking longer, alternative routes as that would increase VMT.</p> <p>The creation and adoption of zero-emission goals can be an effective instrument for setting an agenda and catalyzing clean mobility. Net-Zero Emission initiatives, and climate emergency declarations can be especially effective in combination with LEZ. Such declarations can have a resonating effect on the surrounding community and can also help move climate action goals to the top of the</p>	<ul style="list-style-type: none"> ▪ Around 200 LEZs are around the globe, mostly concentrated in Europe, with reported improvements in local air quality. For example, in London, between 2017 and 2020, roadside measurements within the LEZ showed an estimated reduction in NO₂ emissions of approximately 44%.

	<p>governing body’s agenda (i.e., funding). It can also notify key stakeholders and private companies doing business in the region that they must be held accountable for their carbon footprint.</p>	<ul style="list-style-type: none"> ▪ The City of Santa Monica, California recently became the first city in the United States to pilot a Zero Emissions Delivery Zone. Although it is only a voluntary program, it is a good example of how to successfully build sustainable partnerships between public, private, and community stakeholders. To support the pilot and encourage new participants, this pilot provides priority curb access for ZED in selected locations in the zone.²⁹
<p>B. Fleet Management and Operations:</p> <p>6. Cargo Bikes</p>	<p>Maneuvering and parking large trucks on congested, narrow city streets can be hazardous for drivers, cyclists, and pedestrians. Non-motorized or electric-assisted cargo bicycles have been gaining popularity in North American and European cities for last-mile deliveries. Small-sized goods are typically consolidated at an Urban Consolidation Center or vicinity loading zone and transported to the final market destination. Cargo-bike deliveries are more effective in neighborhoods with high urban density and suitable bicycle and pedestrian infrastructure. They are not viable in less dense areas where average trip distances increase substantially, or where bicycle and pedestrian facilities are not provided as</p>	<p>Research estimated that a single cargo bike can save 13 tons of CO₂ emissions per year.³⁰</p> <ul style="list-style-type: none"> ▪ In Portland, the B-Line provides cargo-bike delivery service out of their consolidation center called “at the Redd,” in order to reduce emissions and promote local development.

²⁹ <https://www.freightwaves.com/news/electric-cargo-bike-tackles-last-mile-delivery-in-california>

³⁰ https://www.dot.y.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C-11-11%20Final%20Report_Oct%202014.pdf

mixing with vehicular traffic could put the safety of the cargo-bike rider at risk.

Cargo bikes offer the following advantages over small delivery vans and light trucks making short trips:

- Reduced emissions and noise levels, where they are permitted to operate on public roads.
- Increased route flexibility and door-to-door service, since they can utilize both vehicle and bicycle infrastructure -assuming the latter is permitted by the City for human-powered cargo bikes.
- Improved road safety due to greater compatibility with pedestrians and cyclists, assuming cargo bikes travel at appropriate speeds.
- For shorter trips, there is potential for faster delivery times than traditional trucks in congested city centers.

Agencies in the San Diego region could consider increasing the use of cargo bikes by:

- Working with the private sector to identify barriers to the wider adoption of cargo bikes and work to lower infrastructure or regulatory barriers.
- Working with the private sector to disseminate information on cargo bikes and establish peer knowledge exchanges.

- In Toronto, UPS started a cargo-bike pilot for downtown deliveries. Bikes are 2.8 meters long, 1.2 meters wide, and weigh 217 kg empty. UPS wanted to use electrically assisted bikes; however, provincial regulations did not allow them.
- Companies like DHL, UPS and FedEx are implementing delivery tricycles in North American and European cities. Places where traffic congestion in the urban core is prevalent—such as Seattle, Downtown Pittsburgh, Portland, and New York City—are allowing cargo bikes on roads, including even offering free parking as an incentive.

B. Fleet Management and Operations:

7. Delivery Lockers

These are lockers that can be used in different contexts to allow people access to their packages without requiring delivery to their homes. Delivery lockers could be located in public areas, residential or office buildings, high-traffic commercial establishments (such as grocery stores), or at the establishments of package integrators (such as UPS and FedEx). The advantage of these lockers is that they help eliminate trips to deliver or pick up packages at people's homes, which reduces truck travel and GHGs.

The main challenge implementing lockers is the high degree of private-sector coordination required and the costs of maintaining and operating the lockers. This can be a challenge because the lockers need to be located on third-party property. Other challenges have included the upfront fixed costs, developing streamlined information systems to track the deliveries and alert consumers, and the security of the packages. However, the savings of completing a delivery through locker are substantial. It was estimated by the Council of Supply Chain Management professionals that the hand-off of packages to consumers accounts for 28% of all transportation costs. Much of these costs would be saved through locker deliveries. Lockers can also facilitate ODP by allowing packages to be delivered/picked up at night, generating all of the benefits of ODP, from reducing congestion to improving curbside parking.

- Amazon Hub operates thousands of lockers in over 70 cities around the world (as of 2018). Amazon Hub, a locker system for residential buildings, has been installed widely across North America.
- In Germany, the Hermes Group operates a system of relay points where customers can pick up deliveries. In Germany, there is also Packstation network with automated lockers that is used by Deutsche Post and DHL.³¹
- In France, Kiala provides pickup and delivery services for local businesses using a variety of carriers.

³¹ Rhodes, S., Berndt, M., Bingham, P., Bryan, J., Cherrett, T., Plumeau, P. and Weisbrod, R. (2012), *Guidebook for Understanding Urban Goods Movement*. Final Draft for NCFRP Report 14, Washington, DC: Transportation Research Board.

B. Fleet Management and Operations:

8. Delivery Drones and Robots

Delivery robots and drones represent technologies that are currently being explored to streamline last-mile deliveries. Delivery robots are currently active in some controlled settings, such as at a few universities, making deliveries by using pedestrian infrastructure. These robots can be cost effective in some cases, as it eliminates the need for people to be involved in the delivery; however, the ultimate implications on GHG emissions and the sustainability of the system are unknown. If they replace employees using bikes, then the delivery robots could potentially increase emissions. If they replace trucks, then they would have the effect of decreasing emissions. Delivery drones are another technology that has been touted in recent years as being able to improve the efficiency of the last-mile. However, it is not likely that drones will be widely used in dense urban areas the near future because of logistical and technological reasons. Operating in an urban environment, including having safe landing locations, poses several challenges that remain unresolved. The impact of these technologies on greenhouse gas emissions are also uncertain as the energy requirements to operate a drone can be substantial, especially considering their low weight capacity.

- Robots are currently being tested and used throughout North America for performing certain types of deliveries, often on university campuses; however, there remain many challenges to the widespread adoption of this technology, including security, reliability, speed, and handoffs.
- Delivery drones are being tested in several applications; however, in the medium-term their usefulness beyond a few niche applications is unlikely.

- A pilot program involving the City of San Diego, the U.S. Department of Transportation, and the Federal Aviation Administration has explored the use of drones for delivery of food, beverages, medical specimens, and packages. The future of drones for deliveries and other uses depends on technological capabilities, as well as the development of regulatory frameworks at the federal, state, and local levels.³²

³² San Diego UAS Integration Pilot Program: Mid-Program Report. City of San Diego, 2019.

C. Infrastructure Improvements:

1. Sustainable Congestion Relief

Traffic congestion in metropolitan areas create major economic, environmental and health impacts, of which, the trucking sector is a significant contributor. Infrastructure projects to help reduce congestion can also yield impacts in reducing these impacts, including potential GHG impacts from trucking idling. Roadway congestion also makes it hard for trucking companies to set and meet delivery schedules. Missing a delivery appointment can lead to production disruptions, stock-outs at retail establishments, and delays that cascade throughout the supply chain. Addressing major truck bottlenecks will allow for the whole roadway system to operate more efficiently, improving the utilization of existing assets.

The solution that most effectively resolves truck bottlenecks depends on the causes of the bottleneck. In most cases, an engineering analysis is required to identify the capacity, geometric, or operational causes of the bottleneck, and to identify cost-effective solutions. The Federal Highway Administration provides general guidance on addressing bottlenecks, including cost-effective ways of increasing capacity, ramp metering, improved signal operations, and intelligent transportation systems (ITS), among others.

Congestion Mitigation and Air Quality Improvement Program is a Federal Highway Administration administered program to provide flexible funding source to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce

- Projects that streamline the border and reduce truck delay will have a positive impact on emissions in the San Diego region.³³ This could include recommendations from the California Sustainable Freight Action Plan: Advanced Technology Corridors at Border Ports of Entry, such as installing equipment to measure southbound border wait times and displaying this information through an advanced traveler information system to better manage commercial and passenger vehicle traffic at the border.
- ITS solutions can also improve traffic operations at significantly lower cost than increasing roadway capacity. Example could include the Harbor Drive 2.0 Project in San Diego.³⁴

³³ https://www.sandag.org/uploads/publicationid/publicationid_4746_28762.pdf

³⁴ <https://www.portofsandiego.org/press-releases/general-press-releases/port-master-plan-update-leads-vision-cargo-haul-road-part>

	<p>congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter.</p>	
<p>C. Infrastructure and ITS Improvements:</p> <p>2. Multimodal Connectivity and Efficiencies</p>	<p>Shifting freight from a high emission mode, such as trucking, to a lower emission mode, such as rail and water, has the potential to reduce total emissions. The EPA estimated that aggregate trucks generate 13 times more emissions per ton-mile moved than water, and 3 times more emissions per ton-mile than rail. However, achieving these mode shifts is complex, and often very difficult. Truck, rail and water modes typically serve different markets because of their different operating characteristics and performance. A shipper that pays a premium for the speed and flexibility of trucking is unlikely to readily shift to using rail to reduce emissions, given that the shipment is likely to be much slower.</p> <p>Shifting long-distance shipments from truck to rail can be encouraged by promoting the competitiveness of rail infrastructure in the region. The San Diego region does not have a rail intermodal terminal. However, the region is connected to the rest of the nation through the BNSF railroad on the LOSSAN corridor, and other inactive railroads (e.g., the San Diego & Arizona Eastern Desert Line). This represents a key mode used to transport automobiles from the PASHA terminal at the port of San Diego. This includes autos imported by sea, from Asia, Europe, or Mexico, and autos trucked over the Mexican border from the Toyota plant in Tecate. Autos that are not moved by rail need to be trucked north to rail terminals in the Inland Empire. Maintaining and</p>	<p>Methods for State DOTs to Reduce Greenhouse Gas Emissions from the Transportation Sector (2022)</p>

expanding the capacity of this rail corridor is critical to avoid automobiles to be moved by truck inland, which would greatly increase emissions. SANDAG has plans underway to fully double-track the LOSSAN corridor and make several operational and safety improvements. A realignment of the route is studied near the Del Mar Bluffs. SANDAG stresses that any passenger rail improvements to the LOSSAN corridor line complement freight rail operations to avoid losing freight service.

Additionally, separating at-grade crossings can further improve operations and eliminate conflicts, making rail more competitive, while eliminating emissions from automobiles and trucks from frequent crossing closures.

C. Infrastructure and ITS Improvements:

3. Dedicated Truck Lanes (DTLs)

Dedicated truck lanes seek to improve the speed, reliability and operations of traffic by separate trucks from general-purpose traffic. These improvements in operations would reduce emissions for general-purpose traffic and trucks. However, constructing new dedicated truck lanes would be expensive, and would most likely require a tolling scheme; however, this is often opposed by trucking industry groups. On the other hand, repurposing general traffic lanes as dedicated truck lanes is often opposed by communities, making these types of projects challenging to implement.

Climbing and descending lanes are another example of an opportunity to keep trucks safely moving up or down steep grades and allow surrounding passenger vehicles to continue in other lanes unimpeded by the slower trucks.³⁵

Dynamic lane assignments on highways and arterials provide the opportunity to accommodate trucks during seasonal, event-driven, or daily peak truck traffic times, allowing trucks to travel without mixing—or with reduced mixing—with general-purpose traffic. Dynamic lane assignments with variable speed limits by lane also help reduce speed differentials and stop-and-go traffic conditions, thus reducing shifting and resulting in fewer emissions and better fuel economy. Combined with ITS technologies such as lane-keeping and in-vehicle notifications, these strategies can enhance truckers' communications with regulatory agencies and improve

- While the concept of dedicated truck lanes has been studied for almost 20 years, there is only one major example in the United States, operated by the New Jersey Turnpike Authority.³⁷ Significant study has been conducted on other corridors, including I-70 (Illinois, Missouri and Ohio)³⁸ and I-75 in Georgia.³⁹ The I-75 project is the most likely to be constructed; however, it was recently announced that it will be delayed by 3.5 years.⁴⁰
- SANDAG indicates that dedicated truck lanes are most likely to be beneficial on the SR 905/I-805 interchange and other parts of the network with significant truck volumes.

³⁵ SANDAG. Appendix Y – Goods Movement Planning and 2021 San Diego and Imperial Counties Freight Gateway Study

³⁷ <https://www.sciencedirect.com/science/article/abs/pii/S0965856418301265>

³⁸ <https://www.tredis.com/clients/43-x-case-studies/41-i-70-dedicated-truck-lanes>

³⁹ <https://0014203-gdot.hub.arcgis.com/>

⁴⁰ <https://www.monroecoga.org/2022/03/07/gdot-announces-delay-in-i-75-commercial-vehicle-lanes-project/>

	truck mobility and safety. ³⁶	
<p>C. Infrastructure and ITS Improvements:</p> <p>5. Expansion of Truck Parking Facilities</p>	<p>Most heavy trucks need to park for long-term periods, especially on long-haul trips, to rest and meet federal Hours of Service regulations. Recent studies such as The Oregon Commercial Truck Parking Study⁴¹ describe the difficulties that truck drivers have in finding parking in urban areas. This leads to parking in undesignated locations, or on public roadways/parking lots, where trucks need to keep their engines idling to maintain power in the cabin to keep the electrical system on, including heating. However, these idling activities contribute to increased air emissions, including GHGs. Emissions generated from trucks idling to heat and cool the trucks as drivers take federally mandated breaks can significantly contribute to poor air quality and GHGs in the region. Expanding the availability of truck parking spaces in and around urban areas is likely to reduce emissions and improve sustainability. When parking availability is limited, truck drivers have to incur additional VMT driving to find a space, which generates emissions and congestion on the roads.</p>	<p>Truck parking capacity is being expanded across the country, including in California. There exists significant interest in this area, to both improve the efficiency of trucking operations, but also to improve the quality of life on the road and increase driver retention.</p>
<p>C. Infrastructure and ITS Improvements:</p> <p>6. Intelligent Transportation Systems (ITS)</p>	<p>Different ITS technologies can be implemented to improve the efficiency of freight operations. These could include:</p> <ul style="list-style-type: none"> ▪ Freight signal priority ▪ Truck parking availability information ▪ Advanced travel information systems (such as FRATIS) 	<p>The San Diego Port Tenants Association, through a California Energy Commission grant, implemented a freight signal prioritization (FSP) pilot project along Harbor Drive in San Diego's Working Waterfront.⁴² The FSP pilot operated for a year and preliminary results were</p>

³⁶ SANDAG. Appendix Y – Goods Movement Planning and 2021 San Diego and Imperial Counties Freight Gateway Study

⁴¹ <https://www.oregon.gov/ODOT/Projects/Project%20Documents/OCTPS%20Methodology%20Assessment.pdf>

⁴² "Cleaning the Air: San Diego Port Tenants Association Zero-Emission Freight Project," San Diego Port Tenants Association YouTube Channel, November 16, 2020, [youtube.com/watch?v=RC0HGs86YHs](https://www.youtube.com/watch?v=RC0HGs86YHs).

- Real-time information systems and dynamic routing
- Border crossing management systems

Other ITS strategies—such as gate operating systems and truck reservation systems being studied as part of Harbor Drive 2.0 Project and the Harbor Drive 2.0 Concept of Operations—can also provide opportunities to improve operational efficiency for marine terminals.

released on February 2022. Summary results show improvements for travel times and reduction in idle times.⁴³

⁴³ Final Report: San Diego Port Intelligent Transportation System Freight Signal Priority. February 2022.

5. DRAFT SCREENING FRAMEWORK

The draft screening framework to assess existing practices was developed after conducting literature reviews and best practices analysis. The screening framework is intended to serve as a tool to help identify existing projects, programs, and policies in alignment with the project vision statement that can help meet regional needs and priorities.

5.1 Project Purpose and Need

The screening framework is guided by following the purpose and need of this project:

- Region critical to state, national and international economies
- Freight is economic engine but produces greenhouse gas emissions
- State prioritized transition of freight sector to sustainable technologies
- Lessen the disproportionate environmental health burdens on vulnerable communities and tribal governments
- State and regional plans have highlighted need for sustainable regional freight vision
- Implement actionable multimodal projects and policies

5.2 Draft Vision Statement

Based on the project purpose and need the following vision statement was developed:

Implement multimodal freight-related projects and policies that improve sustainability and lessen disproportionate environmental health burdens on vulnerable communities and tribal governments while supporting the region's economy and its role as a trade gateway.

5.3 Sustainability Implementation Steps

The successful implementation of freight sustainability projects and policies requires a life-cycle approach that centers around learning as much as possible about how the system operates, the constraints of stakeholders, the possibilities and limitations of technologies, and a ground-level understanding of community impacts. Figure 3 describes some of the steps that are helpful in developing this understanding and implementing projects or strategies that work in the real world and achieve sustainability objectives.

Figure 3: Sustainability Implementation Steps



Source: Adapted from [Euromonitor](#)

Within the overall sustainability approach presented in Figure 3, this sustainable freight implementation strategy would comprise the first three steps. Step 1 is to outreach with relevant stakeholders to initiate buy-in. Step 2 is to assess and prioritize the most effective policies and interventions based on inputs from the outreach in Step 1 and other analyses. Step 3 involves building partnerships with key stakeholders in order to obtain their commitment and collaboration. This memo is developing a prioritization framework as part of the second step. Once approved by the Freight Stakeholders Taskforce, the prioritization framework would then be used to prioritize projects and policies in later tasks.

5.4 Freight Sustainability Prioritization Framework

The objective of the scoring framework is to prioritize the actions that most efficiently achieve the freight sustainability goals of the relevant San Diego regional authorities, including SANDAG, ICTC, and SCAG. Actions can include a wide range of projects, strategies, and programs, requiring the prioritization framework to be flexible and able to be applied generally. To quantify expected benefits, points will be awarded to criteria in the three areas of environment, equity, and economy. See Table 1 for a description of how points will be awarded and weighted. The criteria selected to represent these three areas were chosen narrowly so that they can be evaluated concretely, focusing the attention of the prioritization process on what is most important to SANDAG and ICTC as set forth in the project purpose and need. Other criteria could be included; however, this should be done carefully as it would dilute the impact of other criteria. Criteria will be evaluated as quantitatively as possible, given data and information available. Varying degrees of professional judgment is expected to be required for scoring the criteria.

Two criteria were selected to capture environmental impacts: reduction of GHGs and reduction of criteria pollutant emissions. Both are weighed equally. Some projects might lead to the reduction of criteria pollutants but not GHGs, such as some of the engine technologies being considered. Other criteria were considered, such as noise pollution; however, it was determined that focusing this prioritization effort on air pollution was justified as this is the main way that freight transportation impacts the environment and that is the focus in the project purpose and need.

Equity was captured by the criteria shown in Table 1, aligning with how CalEnviroScreen

4.0⁴⁴ was used in the 2021 Regional Plan with the addition of AB 617 communities⁴⁵. Projects that benefit the most vulnerable communities (Top 25% of CalEnviroScreen 4.0 scores and/or AB 617) will be awarded more points than those that benefit vulnerable communities (Top 50% of CalEnviroScreen 4.0 scores, or Tribal Land). Some projects under consideration have not been planned for specific locations in the region when this assessment was developed. Many such projects will accrue benefits to vulnerable communities because impacts from freight disproportionately affect those communities. This assumption will be carried throughout the San Diego and Imperial Counties Sustainable Freight Implementation Strategy. For the screening, a non-location specific project will receive a score between 1 and 10.

The vital economic role that the freight transportation system plays needs to be considered when seeking to improve its sustainability. Two criteria were selected to succinctly capture this imperative, focusing on improvements to the efficiency and the capacity of the system. Efficiency relates to how well the system moves freight, in terms of speed, reliability, costs, etc. Improvements to freight efficiency benefits consumers and businesses in the San Diego and Imperial region, boosting economic activity and employment. Improvements to freight capacity often lead to improvements in efficiency, as a system that is less congestion will operate more efficiently. These improvements can also generate additional benefits such as improving the ability of the system to accommodate expected increases in freight and trade, catalyzing economic growth.

⁴⁴ <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>

⁴⁵ Under the 2017 Assembly Bill 617 (C. Garcia, Chapter 136, Statutes of 2017), CARB established the Community Air Protection Program (“Program”) to focus on reducing exposure in communities most impacted by air pollution. Starting in 2018, the Program has selected a number of communities every year using numerous data sources, tools, and approaches to guide the selection and prioritization of communities and the funding available to the program. For details about the communities selected each year and how they are selected, please see: <https://ww2.arb.ca.gov/our-work/programs/community-air-protection-program/community-identification/community-air>

Table 1: Scoring of Benefits

Areas	Criteria	Scoring	Weighting
Environment	Impact on reducing emissions of GHGs	1 - 10	35%
	Impact on reducing emissions of criteria pollutants (particulate matter, NO _x , VOC, etc.)	1 - 10	
Equity	Degree to which benefits accrue to most vulnerable communities (Top 25% of CalEnviroScreen 4.0 scores, or AB 617), and vulnerable communities (Top 50% of CalEnviroScreen 4.0 scores, or Tribal Land), including safety considerations	1 - 10	35%
Economy	Improves efficiency (speeds and reliability) of freight transportation system	1 - 10	30%
	Improves capacity of freight system to accommodate expected increases in freight	1 - 10	

To identify the freight projects that best achieve sustainability objectives, and are most likely to be effective, it is necessary to also consider their costs and potential impediments. Table 2 describes how these will be considered in the prioritization process. An approximate estimate of implementation costs will be weighed the most heavily. Other factors that could impede the implementation of the project will also be considered, such as lack of funding, need for support of numerous stakeholders, technological complexity, and lack of consideration in existing planning processes. Projects with high scores in terms of costs or impediments will rank lower in the prioritization framework. However, high cost or impediment scores can be counterbalanced if there are substantial benefits, as described in the next section.

Table 2: Scoring of Implementation Costs and Impediments

Areas	Criteria	Scoring	Weighting
Costs	Approximate implementation costs	1 - 10	35%
Funding	Lack of funding match	1 - 10	25%
Stakeholder Support	Does implementation require legislative changes and/or seeking support of many competing stakeholders?	1 - 10	15%
Technological Complexity	Does the technology still require further testing/development and is it not ready for application? Are there regulatory impediments to implementing this technology?	1 - 10	15%
Planning Continuity	Not considered in local or regional plans or programs and/or conflicts with other modes	1 - 10	10%

The key output of a benefit-cost analysis is the benefit-cost ratio, which identifies whether projects are expected to generate more benefits than costs. A similar logic will be adopted in the prioritization framework, by dividing the scoring of benefits by the scoring of costs and impediments, as shown below, to calculate the Freight Sustainability Implementation Score.

$$\text{Freight Sustainability Implementation Score} = \frac{\text{Scoring of Benefits}}{\text{Scoring of Costs and Impediments}}$$

After this prioritization framework is finalized by the Freight Stakeholder Taskforce, projects will then be ranked according to the Freight Sustainability Implementation Score in later tasks.

Appendix B:

Memo Addendum

ADDENDUM TO SAN DIEGO AND IMPERIAL COUNTIES SUSTAINABLE FREIGHT IMPLEMENTATION STRATEGY: FINAL EXISTING CONDITIONS AND SUSTAINABLE FREIGHT BEST PRACTICES

This addendum reflects a modification to the Final Existing Conditions and Sustainable Freight Best Practices Memorandum. Table 1 and 2 criteria were originally proposed to be scored on a scale between 1 and 10. This approach was developed by the Project Development Team (PDT), presented to the Freight Stakeholders Taskforce, and included in the Final Existing Conditions and Sustainable Freight Best Practices Memorandum. While working through the process of assigning scores, the project development team noted that a smaller scale would be more appropriate, given the conceptual nature of projects, programs, and policies being evaluated. The updated range for scoring, as indicated below, is between 1 and 3. The weighting of areas are unchanged. In addition, the descriptions of the criteria in Table 2 were reworded for greater clarity such that higher scores correspond with greater feasibility.

Modified text is shown as underlined.

Changes to p. 55

Table 1: Scoring of Benefits

Areas	Criteria	Scoring	Weighting
Environment	Impact on reducing emissions of GHGs	1 - 3	35%
	Impact on reducing emissions of criteria pollutants (particulate matter, NO _x , VOC, etc.)	1 - 3	
Equity	Degree to which benefits accrue to most vulnerable communities (Top 25% of CalEnviroScreen 4.0 scores, or AB 617), and vulnerable communities (Top 50% of CalEnviroScreen 4.0 scores, or Tribal Land), including safety considerations	1 - 3	35%
Economy	Improves efficiency (speeds and reliability) of freight transportation system	1 - 3	30%
	Improves capacity of freight system to accommodate expected increases in freight	1 - 3	

Changes to p. 56

Table 2: Scoring of Feasibility

Areas	Criteria	Scoring	Weighting
Costs	Approximate implementation costs	1 - <u>3*</u>	35%
Funding	<u>Availability of funding</u>	1 - <u>3</u>	25%
Stakeholder Support	<u>Support for implementation from stakeholders and legislative bodies</u>	1 - <u>3</u>	15%
Technological Complexity	<u>Readiness of the required technology, including testing, development, and regulatory compliance</u>	1 - <u>3</u>	15%
Planning Continuity	<u>Consistent with local or regional plans or programs and/or in alignment with other transportation modes</u>	1 - <u>3</u>	10%

*Costs scoring will be such that low-cost strategies are assigned a high score and high-cost strategies will receive a low score.

The ability to implement the strategies will be determined by considering both benefits and feasibility.

Appendix C:

Innovative Strategies Screening Memorandum
and Addendum



SAN DIEGO AND IMPERIAL COUNTIES SUSTAINABLE FREIGHT IMPLEMENTATION STRATEGY

FINAL INNOVATIVE STRATEGIES SCREENING MEMORANDUM

December 2022

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1. PURPOSE AND SCOPE

As part of the San Diego and Imperial Counties Sustainable Freight Implementation Strategy, this Innovative Strategies Screening Memorandum provides an overview of existing freight-related projects and project types in the regional plans within the study area. It describes how different types of projects may score under the Screening Framework developed as part of Task 3 - Existing Conditions and Sustainable Freight Best Practices. Specifically, this memorandum provides an initial screening of different existing project types under three primary goal areas: Environment, Equity and Economy. While a detailed scoring won't be completed until later in the project, Table 1 sets forth the criteria that are generally considered at this stage.

Table 1: Scoring of Benefits

Areas	Criteria	Scoring	Weighting
Environment	Impact on reducing emissions of GHGs	1 - 10	35%
	Impact on reducing emissions of criteria pollutants (particulate matter, NO _x , VOC, etc.)	1 - 10	
Equity	Degree to which benefits accrue to most vulnerable communities (Top 25% of CalEnviroScreen 4.0 scores, or AB 617), and vulnerable communities (Top 50% of CalEnviroScreen 4.0 scores, or Tribal Land), including safety considerations	1 - 10	35%
Economy	Improves efficiency (speeds and reliability) of freight transportation system	1 - 10	30%
	Improves capacity of freight system to accommodate expected increases in freight	1 - 10	

Source: Existing Conditions and Sustainable Freight Best Practices

This memorandum also builds upon the best practices analysis conducted in Task 3 by suggesting innovative strategies that may be appropriate for each of the project categories in the San Diego Association of Governments (SANDAG) and Southern California Association of Governments (SCAG) regional plans and for the overall San Diego and Imperial Counties study area.

The memorandum suggests best practices in each of three categories: Technology Solutions, Fleet Management and Operations, and Infrastructure Improvements, with specific intention of providing innovative strategies relevant to both improve projects in existing regional plans and to augment those plans with new sustainable freight initiatives.

2. EXISTING FREIGHT CONDITIONS

Table 2 below summarizes the anticipated performance of various types of projects in current regional plans against the criteria from Task 3. The project types and their sustainability characteristics are further described in the remainder of this section.

Table 2: Summary of Existing Projects in the Screening Framework

Types of Existing Projects	Proposed Screening Framework		
	Equity	Environment	Economic
Complete Corridor	Moderately favorable	Moderately favorable	Moderately favorable
Marine Terminals	More favorable	More favorable	More favorable
Port of Entry Projects	More favorable	More favorable	More favorable
Truck Parking	Moderately favorable	More favorable	More favorable
Rail Projects	Less favorable	More favorable	More favorable
Grade Separation	More favorable	More favorable	Moderately favorable
Airport Projects	Moderately favorable	Moderately favorable	More favorable

2.1 Complete Corridor and Highway Projects

Complete Corridors provide a variety of travel choices and use technology to manage how highways and major roads are used in real time. They provide a balance of dedicated, safe space for everyone, including freight vehicles and people who walk, bike, drive, ride transit, and use Flexible Fleets. These projects include managed lanes, alternative fuel corridor improvements, truck climbing lanes and freight signal prioritization projects. Specifically, freight-related Complete Corridor projects across San Diego and Imperial Counties have potential to score favorably in the freight sustainability framework to the degree that they improve the fluidity and operations of traffic, reduce negative externalities resulting from trucks idling in congestion (primarily from emissions), and improve the capacity of the system to accommodate expected increases in truck traffic.

The California Transportation Commission (CTC) is developing a Clean Freight Corridor Efficiency Assessment as mandated by Senate Bill (SB) 671. Priority Clean Freight Corridors have been identified by the SB 671 workgroup as priority candidates for zero-emission infrastructure. Corridors in the study area include the following:

- Interstate (I-) 5, I-805, State Route (SR) 905, and SR 11 between the Orange County/San Diego County line and the Otay Mesa and future Otay Mesa East Ports of Entry (POEs)
- I-15 between the Riverside County/Orange County line and I-5 in San Diego
- I-8 between I-5 in San Diego and the California/Arizona line
- SR 86, SR 78, SR 111, and SR 7 between the Riverside County/Imperial County line and the Calexico East POE

These corridors have the most significant interregional truck traffic and should be prioritized for zero-emission infrastructure capable of supporting medium- and heavy-duty vehicles. Any additional segments designated as alternative fuel corridors through the Federal Highways Administration are likely to be included in the CTC's Clean Freight Corridor Efficiency Assessment.

From an equity standpoint, many of the Complete Corridor and highway projects are likely to score moderately favorably, as they are in, or potentially serve, vulnerable communities. These include communities in El Cajon, La Mesa, San Diego, National City, and Chula Vista in San Diego County and Calexico, Heber, El Centro, and Westmorland in Imperial County. Complete Corridor projects may improve traffic flows and reduce congestion on these corridors, which in turn could decrease pollutant emissions into these vulnerable communities. They may also avoid diversion of traffic onto local roads that can occur when traffic is backed up. Improving the design, geometrics, and operations could likely reduce crashes and benefit adjacent communities that use these corridors. To the extent that they add lanes, however, they may increase impacts on these communities through increased noise, right-of-way, and emissions impacts. Thus, it will be important to consider the particular characteristics of the projects to determine the benefits and impacts for vulnerable communities.

From an environmental standpoint, the improvement of traffic flows and reduction in congestion achieved through Complete Corridor and highway projects will have a positive near-term effect on emissions. Projects that encourage alternative fuels usage and increase operational efficiency may reduce the emissions of greenhouse gas (GHG) and criteria pollutants. However, induced demand from improvements in capacity will, over time, lead to an increase in general purpose traffic and truck volumes and result in increased emissions. Therefore, it is important that improvements to vehicle technology compensate for these increases in travel and ensure that overall emissions do not increase. Section 3 of

this memorandum includes several ideas for how to accelerate these improvements in technology.

Lastly, from an economy and competitiveness perspective, Complete Corridor and highway projects could score favorably in their ability to improve efficiency of freight transportation systems by potentially expanding capacity for freight. This will likely depend on whether the managed lanes reduce congestion or provide other freight benefits. However, it is important to note that under current California laws, trucks aren't allowed in managed lanes themselves. Therefore, managed lanes improvements might offer operational efficiencies for freight only indirectly, i.e., if they redirect other traffic towards managed lanes. Additional discussion is included in the Infrastructure Improvements section.

2.2 Marine Terminal Projects

The Port of San Diego (Port) is the southern terminus of the Marine Highway M-5 Coastal Connector, designated through the United States Maritime Administration's America's Marine Highway Program. The short sea transportation route between the Port of San Diego, Southern Oregon Port, and the Port of Bellingham, Washington is an extension of the surface transportation system and will support barge service of lumber, refrigerated and non-refrigerated containers, rolling stock, and household goods along the West Coast of the United States.

The Port has two marine terminals, the Tenth Avenue Marine Terminal and the National City Marine Terminal. Proposed improvements to both terminals are likely to score favorably in the sustainability prioritization framework because they improve the connectivity between water and rail infrastructure, reducing the region's reliance on trucks for most freight transportation. The marine terminal projects include components to accelerate the electrification of freight infrastructure and adoption of zero- or near-zero-emission vehicles for on- and off-road applications.¹ Projects also include installing shore power systems, enabling vessels to turn off their engines while at berth and reduce emissions.

From an equity standpoint, marine projects that improve sustainability would score favorably because of their location. Both terminals are in, and are surrounded by, vulnerable communities.

From an environmental standpoint, sustainable marine projects score favorably. Since marine ports are a hub for many freight vehicles, technologies and improvements to fuel technology, idling reduction technologies, and practices to increase operational efficiency

¹ Note that various zero- and near-zero technologies are encouraged within the state, and this effort is not attempting to prioritize one alternative fuel over another. For more information about requirements and incentives please see the California Air Resources Board (CARB) website: <https://ww2.arb.ca.gov/our-work/programs/alternative-fuels>

could have significant reductions in GHG and air pollutant emissions. Idling reduction technologies include Auxiliary Power Units (APU), either battery electric or powered by high-efficiency diesel generators, as well as electric and heating, ventilation, and air conditioning (HVAC) hook-ups.

Several of the sustainability best practices identified are already being implemented in the marine terminal projects. The Port of San Diego's Maritime Clean Air Strategy includes ambitious goals and strategies for reducing emissions at the port, including a goal that 100% of cargo trucks calling the port to be zero-emission and 100% of cargo handling equipment to be zero-emission by 2030. Progress towards these goals can be accelerated by investing in charging infrastructure, particularly in projects that include truck parking at or near the marine terminal.

2.3 Port of Entry Projects

Planned Port of Entry (POE) projects include the construction of the Otay Mesa East POE in San Diego County and expansion of the Calexico East POE in Imperial County. Improvements to nearby truck routes, such as Menvielle Road and SR 7, would also support cross-border commercial vehicle traffic. It is assumed that zero-emission charging/refueling stations would also be developed in the vicinity of the POEs to support cross-border drayage operations. These projects are intended to increase the capacity and efficiency of, and reduce emissions associated with, cross border trade. Therefore, they could potentially score favorably under the sustainability framework.

Planned POE projects are located in, and surrounded by, vulnerable communities. They would improve the efficiency of the freight transportation system and reduce delay and emissions in vulnerable communities.

From an environmental standpoint, POE projects could score favorably, as POEs are hubs for many commercial trucks and freight vehicles. Fuel technology improvements, idling reduction technologies, and practices to increase operational efficiencies could all have significant reductions in GHG and air pollutant emissions. Reducing idling at queues would also reduce the criteria pollutants emitted at these locations.

Lastly, from an economy and competitiveness perspective, POEs are likely to score favorably. Generally, improved POE operational efficiency could help with operations and logistics and therefore increase economic competitiveness.

2.4 Truck Parking Projects

Truck Parking projects would modernize existing truck parking areas for near-zero and zero-emission infrastructure truck plug ins. Locations especially suited to benefit from truck parking projects include those along intercity freight corridors, near marine ports, and those near the main commercial vehicle ports of entry: Otay Mesa in San Diego County and Calexico East in Imperial County. These are generally distant from residential and other sensitive land uses, mitigating the localized impacts of truck traffic, but can meet the needs of truck drivers by providing amenities and minimizing out-of-direction travel. Additional discussion is included in the Technology Solutions section of the memorandum.

Truck parking projects score favorably in the sustainability framework because they help facilitate the electrification of the truck fleet and improve the fluidity and operations of the freight sector.

From an equity standpoint, some of the truck parking projects are in vulnerable communities and are likely to score favorably, as they would reduce emissions impacts from existing truck parking facilities. If future projects were to add new truck parking spaces, they could reduce impacts from undesignated parking and out of direction truck travel that results when truck drivers cannot find appropriate parking. However, new parking spaces could raise concerns about other local impacts. Projects should be evaluated on a case-by-case basis to reflect pros and cons in the unique context of each site. They should also reflect the recommendations of the 2022 California Statewide Truck Parking Study.

From an environmental standpoint, since current projects focus on zero-emissions and renewable energy fuel options, they would score favorably.

Lastly, from an economy and competitiveness perspective, increased number of truck parking and modernization of truck parking facilities could lead to increased competitiveness and economic opportunities.

2.5 Rail Projects

Projects that improve the capacity and service of rail transportation can generate some of the largest improvements in sustainability, by taking trucks off the roads and shifting them onto a more sustainable mode. Moreover, rail is cost competitive for shipments of more than 500 miles. Rail technology is evolving and can be three to ten times more fuel efficient than trucking, per tonnage moved, which leads to lower greenhouse gas emissions and criteria pollutants.

Despite the general air quality benefits of rail compared to truck, significant opportunities to reduce air pollution in freight train operations exist. Switching operations at rail yards contribute to local air pollution; a [Health Risk Assessment](#) completed by the Port of San Diego in 2022 and limited to port-related emissions found that rail switching operations were the greatest contributor to local cancer risk in National City near the BNSF National City Yard. Converting switcher locomotives to hybrid, near-zero, or zero-emission technologies would be consistent with state priorities as outlined in the California State Transportation Agency's [Climate Action Plan for Transportation Infrastructure](#) (CAPTI) and reduce health risk in nearby communities.

SANDAG plans to double-track the Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor between the Orange County line and Downtown San Diego, increasing the capacity of the railroad for both freight and passenger operations. The railroads carry both freight and passenger trains, with freight train operations limited to defined scheduling windows. The proposed Batiquitos Lagoon Double Track project is particularly important for freight because it will allow for the storage of a freight train along the corridor without blocking at-grade crossings or stations. Another project awarded funds for right-of-way through the Trade Corridor Enhancement Program (TCEP) is Sorrento to Miramar Phase 2. This project will increase speed, capacity, and reliability on a steep, windy segment of track with a history of derailments. The full implementation of planned LOSSAN corridor improvements will increase freight rail capacity.

Proposed rail projects also include improvements to the Tijuana-Tecate Interurban Rail Line and the Desert Line. The Tijuana-Tecate Line is operated by Baja California Railroad (BJRR) and spans over 44 miles in length across Baja California, including the municipalities of Tijuana, Garcia, Valle Redondo, and Tecate. On the U.S. side of the border is the Desert Line, which stretches 70 miles from Tecate through the Jacumba Mountains to Plaster City near El Centro. This proposed project would help provide rehabilitation efforts to restore the Desert Line to the proposed basic and modern service levels, potentially leading to operational efficiencies and increased usage of freight rail. This could help alleviate some of the existing truck traffic that currently takes place, particularly truck traffic carrying cargo to US markets and ports from plants located in Tijuana.

From an equity standpoint, while the proposed rail lines do traverse vulnerable communities, it is unclear the degree to which the rail lines directly benefit local community members. While rail can remove trucks from the road and reduce emissions overall, it might increase pollutants at a local level. Additionally, increased rail frequency near at-grade crossings, particularly in vulnerable communities, is a significant concern for safety. Noise pollution, particularly when operations are staggered at off-peak times as with freight rail operations in the San Diego region, disproportionately impact these

communities as well. More discussion is included in the Grade Separation Projects section below.

From an environmental perspective, rail freight is much more energy efficient than trucking on a ton-mile basis, and these projects have a greater sustainable impact than projects that add roadway capacity. Improving the roadway accessibility to rail terminals and other infrastructure would further increase their utilization and competitiveness by ensuring capacity and adequate geometry to accommodate the associated truck traffic.

Passenger services along the LOSSAN corridor also stand to benefit from railroad improvements, and pollution and GHG emission reductions can be achieved through modal shift from vehicular traffic to transit.

From an economy and competitiveness perspective, improved rail lines and routes provide choices to shippers and increase their efficiency, thereby further enhancing regional competitiveness. There may also be opportunities for providing industrial businesses with new or expanded rail spurs. For example, there are existing spurs in the Miramar area of San Diego as well as industrial areas in El Cajon and Chula Vista. Direct rail access could allow businesses to deliver and receive certain goods via train rather than truck. Further study of candidate locations would be necessary to fully evaluate their benefits.

2.6 Grade Separation Projects

Grade separation projects under consideration in Imperial County are located near Calexico and up SR 86 towards El Centro and through Brawley. Grade separation projects under consideration in San Diego County are primarily on the LOSSAN corridor and on the South Line (Blue Line trolley and San Diego & Imperial Valley Railroad) between Downtown San Diego and San Ysidro.

Grade separations and other improvements, such as double tracking, provide benefits for freight and passenger travel. The sustainability of crossing separation projects could be improved by prioritizing those likely to result in the greatest benefits, such as where traffic volume and train crossing frequency are the highest and train speeds are the slowest. Grade-separating truck routes avoid long truck delays and reduce risk of crashes and disruptions at the crossings.

SANDAG's 2015 Regional Plan: Appendix M and the 2018 infrastructure Development Plan for the LOSSAN Rail Corridor in San Diego County each identified potential locations for grade separations, with various criteria used to determine priority. These evaluations did not consider the volume of trucks along the roadways, however. Preliminary analysis suggests that truck volumes on certain roadways may affect the prioritized list, but this would need to be verified by calculating truck delay. Future grade separation analysis with

a sustainable freight emphasis should explicitly include truck volumes and delay imposed by the crossings.

From an environmental standpoint, grade separation projects can generate significant reduction of emissions from the idling of trucks and general traffic. These reductions will be the greatest where the frequency of trains and the roadway volumes are high. Under these conditions, passenger vehicles, as well as trucks, can spend considerable time idling at a closed crossing while trains pass. Over the past decade, there has been a steady trend towards railroads operating longer trains to achieve greater economies of scale. These trains can take 10 minutes or more to clear the crossing, particularly if the crossing is located near a rail terminal and the train travels at a slow speed. Because of queue formation, it often takes considerably longer for all vehicles to clear a re-opened crossing than the time the crossing was closed. Over a day, this can amount to significant emissions of greenhouse gasses and criteria pollutants.

From an equity standpoint, the grade separation projects are in vulnerable communities. These projects have a clear and direct benefit to these communities by helping to increase safety conditions and reduce crashes at crossings. This makes active transportation modes, such as walking and biking, more attractive. Grade separation can also help reduce emissions of pollutants which can be specifically harmful to the local community members. Moreover, these grade separation projects can help reduce congestion in the local area, leading to an improvement of quality of life.

Lastly, from an economy and competitiveness perspective, improved grade separations on an important trade route can reduce congestion, thereby improving overall competitiveness. At-grade crossings on freight routes represent a key source of unreliability. A truck being caught by a closed crossing could be delayed significantly, potentially arriving late at its destination. In modern supply chains, on-time performance is critical, with truck drivers often given a delivery window that is just an hour or two, but sometimes much narrower. Being stopped behind a crossing could lead the driver to miss this delivery window.

Where grade separation projects are not feasible, Advanced Train Detection Systems are a strategy to mitigate the impact of long trains and delays at at-grade crossings. Non-intrusive train detection systems can provide warnings via changeable message signs and freight routing systems so truck drivers can adjust travel if possible.

2.7 Airport Projects

Projects that improve roadway accessibility to airports have potential to score moderately favorably under the freight sustainability prioritization framework.

From an economy and competitiveness perspective, airport projects are likely to score favorably. They improve the reliability of accessing the airport, benefiting high-value goods and industries that rely on air cargo service.

From an equity standpoint however, it is unclear at this point how airport projects will score. The San Diego International Airport (SAN) is neither located in nor directly serves any of the designated vulnerable communities.

Improved nearby roadways and cargo facilities could provide sustainability benefits due to increased efficiency and reduced idling, although the volume of trucks and associated emission impacts are likely to be minor. Limited options exist to improve the sustainability of airport projects because they involve a relatively small number of trucks. Trucks carrying goods to the airport from within the region may be potential targets for a fleet electrification, as they may be smaller and travel shorter distances. This strategy would need to be explored in consultation with the airport and regional air cargo carriers.

Finally, while freight that moves by air has GHG impacts, there are limited modal diversion opportunities. Aircraft manufacturers are working with the airlines to develop more sustainable aircraft. Their adoption would depend on international private sector research and development efforts beyond the scope of this study.

3. STRATEGIES AND PILOT PROJECTS

The previous section of this document described at a high level the extent to which project types contribute to freight sustainability in terms of equity, environment, and economy. The next section of this memorandum will focus on potential innovations for new or refined projects and locations for implementation.

Strategies are presented in the context of three key categories of sustainable freight best practices identified by the project team during the development of the Existing Conditions and Sustainable Freight Best Practices memorandum. These include Technology Solutions, Fleet Management and Operational Solutions, and Infrastructure Improvements. There is significant overlap, and many of the described strategies could be alternatively classified in other categories. The strategies and relevant examples are briefly described here, but more detail may be found in the Existing Conditions and Sustainable Freight Best Practices report.

3.1 Technology Solutions

While the technology exists today that allows electric or hydrogen-fueled locomotives to pull freight over short distances, freight rail locomotives are rarely purchased for switching yards. Locomotives have long useful lives in switching yards, and rebuilding them is more cost effective than buying new ones. Public agencies and private rail operators could potentially partner to replace these locomotives and provide the necessary supporting infrastructure, such as battery electric charging stations or hydrogen refueling stations. For example, San Bernardino County Transportation Authority (SBCTA) is piloting **zero-emission technology**—a hybrid hydrogen fuel cell and battery technology—on the Metrolink Arrow passenger line between San Bernardino and Redlands. While freight trains are heavier and travel longer distances than most passenger trains, limiting technology options, hybrid technology has immediate relevance for freight yards and is being piloted in Europe for longer distances.

A future Pacific Surfliner maintenance facility is anticipated to be built in the San Diego region to serve the popular Amtrak route operating along the LOSSAN corridor. The possibility of this new facility serving as a zero-emission locomotive fueling hub for both passenger and freight trains should be explored, even though there would likely be operational challenges to overcome.

Electric charging technology for on-road vehicles like trucks is likely to continue evolving quickly over the coming years, in terms of capabilities and standards. Therefore, it is critical that recent developments be tracked to ensure that infrastructure meets long-term needs. Moreover, developments in wireless electric vehicle charging potentially have long-term

applications in the trucking sector. If successful, this technology could enable vehicles to charge in motion, reducing the frequency and duration of charging stops. Pilot locations in San Diego County could include Harbor Drive, Bay Marina Drive (entrance to National City Marine Terminal), and Crosby Road (entrance to Tenth Avenue Marine Terminal). Public agencies should also look to develop publicly accessible infrastructure for small and owner-operator trucking companies. The San Diego Regional Medium- and Heavy-Duty Zero-Emission Vehicle (ZEV) Blueprint, a project led by SANDAG and currently underway, will develop reports with critical planning information, such as a ZEV market study, infrastructure siting criteria, and implementation strategies.

The Port of San Diego has released a request for information and will be releasing a request for proposals to develop public charging/fueling stations to support zero-emission trucks at several sites in the San Diego region. Some of these sites are owned by Caltrans, while others are on Port of San Diego tidelands. It will be important to have zero-emission charging/fueling infrastructure near the Port's marine cargo terminals to support drayage truck fleets in anticipation of adoption of the proposed Advanced Clean Fleets regulation by CARB.

Developments in truck parking electrification should follow the needs identified in the California Statewide Truck Parking Study, the Truck Parking Feasibility Guide Supplement – District 11 Site Assessment, and the statewide vehicle electrification plan. Examination of Caltrans' and other publicly owned properties across District 11 identified seven sites that might be feasible, and which were used as examples with possible parking layouts in the Guidelines. SANDAG and the Imperial County Transportation Commission (ICTC) are recommended to work with Caltrans District 11 to explore the development of truck parking on these and other sites. Combining zero-emissions infrastructure at truck parking sites, rest stops, and private truck stops should also be a strategy for consideration to reduce idling and support the achievement of zero-emission vehicle goals. In addition, on-site electrical storage should be considered to balance energy demand load. There are opportunities for public private partnerships in the truck charging and parking space that could facilitate implementation.

Working with local jurisdictions to explore truck parking solutions, both on- and off-street, in and near Barrio Logan and other industrial areas where parking is insufficient, is recommended. This should be done in collaboration with the local jurisdictions. On-street parking could relate to loosening truck parking restrictions where roadway geometry permits in industrial zones. **Off-street truck parking** strategies involve working with shippers and carriers to allow parking for staging and short breaks on site. Working with local jurisdictions to determine and require adequate truck parking in new industrial sites, per [FHWA's Truck Parking Development Handbook](#), is a best practice. This would improve

working and safety conditions for truck drivers, reduce emissions from out-of-direction travel, and improve operational efficiencies.

To mitigate queues at both the port's marine terminals and land POEs, **commercial vehicle appointment window systems** could be considered. This strategy is referenced in the [2021 California-Baja California Border Master Plan](#) and the Sustainable Freight Action Plan Pilot Project Work Plan for Advanced Technology Corridors at Border Ports of Entry.

Regional agencies should consider encouraging and studying opportunities for **truck platooning** for long distance or high-speed truck movements and **Connected and Autonomous Vehicles (CAVs)**. Caltrans District 11, SANDAG, and the City of Chula Vista have established the San Diego region as an [AV Proving Ground](#). This allows for streamlined permitting and closing roads for demonstrations. It would be necessary to establish partnerships and secure funding to take advantage of this existing proving ground. SR 905, with its significant truck traffic, would be a candidate location for demonstrating CAV technologies.

Radio-frequency integrated circuit (RFIC) technology enables data to be transmitted securely at very fast speeds and can provide operational efficiencies for freight-related projects. Applications specific to freight and logistics include Radio Frequency Identification (RFID) technology which can reduce labor intensive tasks of scanning and approving vehicles through checkpoints.

SANDAG is planning to implement various **real-time travel information** communications capabilities through the development of the NextGen 511 Concept of Operations. There is an opportunity to coordinate the dissemination of real-time information with devices inside truck cabs. Public agencies elsewhere are demonstrating the effectiveness of notifications pushed to these devices when there is an immediate safety need. Following are several functionalities that can be considered.

- Truck drivers could receive a notification according to their location. Upon entering a work zone, they could be alerted to the presence of construction workers, uneven surfaces, or unmarked lanes. Drivers could also be given guidance regarding temporary lane configurations such as truck-only lanes.
- Truck safety warning systems could reflect real-time truck operations. Rollover warning alerts would be appropriate for drivers entering tight curves at high speeds, such as freeway interchanges. Downhill speed and over-height warnings could provide similar notifications to drivers for steep grades and low overpasses.
- Monitoring traffic conditions and the locations of traffic queues could enable notifications to drivers to slow down proactively and safely.
- Weigh station bypass service applications already offer pre-clearance for qualified trucks and avoid the requirement for trucks to enter weigh stations. These improve

truck route efficiency and avoid the safety risks of trucks slowing down to exit the freeway and speeding up to re-enter. Their use could be promoted for more widespread benefits.

- Data on hard braking could be used to study the effectiveness of these alerts.
- The monitoring of weather conditions and road closures to support dynamically re-assigned lanes or reduce speed limits to avoid crashes would be critical in an extreme weather event. Additionally, road closures on key truck routes could be coordinated with directing drivers to emergency truck parking facilities.
- After traffic crashes, distress messages could be broadcast quickly using vehicle-to-vehicle and vehicle-to-infrastructure technology.

3.2 Fleet Management and Operations

Toll-collecting agencies could consider providing **toll discounts** to cleaner/greener trucks to accelerate adoption of new technologies. For example, electric trucks and hydrogen trucks could be exempt from tolls, or provided a significant discount, to accelerate their adoption in the region. Similarly, trucks with Fuel Saving Technologies (FST) beyond California regulations could be given preferential pricing on these corridors. Incentives could be phased out as California regulations are tightened in the coming decades.

Clean truck toll discounts could be piloted in areas most impacted by on-highway vehicle emissions, such as the Assembly Bill (AB) 617-designated Portside, International Border, and Calexico-El Centro-Heber Communities. This strategy suggests air quality improvements, but the loss of revenue from commercial vehicles should be weighed carefully. In cases where the repayment of construction bonds relies on toll revenues, it may not be financially feasible for regional toll collection agencies to offer significant discounts. An alternative means could be the use of toll subsidies financed by a state-level agency with a mandate to achieve air quality improvements.

Policymakers should consider that toll discounts may be preferable to exemptions since discounts can be changed over time according to the needs of the incentive program. For example, it could be acceptable to grant near-zero-emission trucks toll discounts in the near term, but those discounts could be reduced or eliminated as zero-emission trucks become the focus of incentives and discounts.

Enforcement of established truck routes in vulnerable communities is a strategy with equity benefits. Truck routes in the Barrio Logan community of San Diego have been established along arterials connecting between the Working Waterfront and highway network. When properly observed, these routes keep trucks off residential streets and avoid safety, noise, and air pollution concerns. **Freight geofencing** is an intelligent transportation systems strategy that tracks vehicles to determine where they are traveling.

Determining when freight vehicles enter prohibited areas can assist with the enforcement of route restrictions.

An **off-peak pick-up and delivery program** would encourage freight activity during less congested times of the day. Implementing this would face challenges with labor constraints. Additionally, communities adjacent to participating businesses or freight routes could experience undesirable, freight-related noise at off-peak times. A program of this type has been used at the Ports of Los Angeles and Long Beach, so an example exists in the broader region. The potential benefits in emission reductions and safety would be tangible, but they would need to be weighed against the potentially disruptive noise impacts.

This strategy would be most useful in areas with high truck volumes and truck-related congestion. The Port of San Diego's marine terminals do not experience the same level of congestion as the Ports of Los Angeles and Long Beach. However, the Otay Mesa POE is one of the largest freight bottlenecks in the region. The hours of operation at the POE are limited by the availability of staff at Customs and Border Patrol and California Highway Patrol's Commercial Vehicle Enforcement Facility. It is expected that the future Otay Mesa East POE will relieve congestion for cross-border truck traffic, but an off-peak system is a strategy to consider in the future.

Urban consolidation and mobility hubs at intermodal facilities and urban areas represent another opportunity to ensure that trucks and small package carriers are properly accommodated with parking, queueing, separate spaces for vans and larger trucks, or other types of hub accommodations, such as those provided by Amazon hubs. Providing incentives for **delivery lockers** in Mobility Hubs could help reduce delivery vehicle trips and reduce emissions and congestion.

San Diego offers potential locations for urban consolidation centers in the Midway/Pacific Highway area near the San Diego International Airport. This primarily warehouse, industrial, and commercial area is close to the densely populated and mixed-use downtown San Diego area. This proximity could enable quick deliveries and limit commercial vehicle miles traveled.

Encouraging the use of **cargo bikes** in denser urban areas would complement urban consolidation centers. The [B-Line](#) in Portland, Oregon is an operating example. Providing incentives and amending bike infrastructure design standards and regulations to allow larger cargo bikes, particularly battery assisted ones, would be helpful implementation actions. Downtown San Diego and close-in neighborhoods such as Hillcrest and North Park are potential locations for the use of cargo bikes, as the combination of destination density and protected bike infrastructure can make it feasible and attractive. However, the use of cargo bikes for commercial trips also depends on appropriate origins—urban consolidation

centers—where goods can be loaded. These sites should have good regional transportation access but also be close to destinations.

Delivery robots are emerging in prominence, with several commercial operations around the U.S. (as described in the best practices memorandum). However, questions remain about their wider applicability and impacts on sustainability. As part of the Flexible Fleets Strategy, SANDAG and regional partners should consider delivery robot accommodations at Mobility Hubs and in Active Transportation projects to ensure appropriate visibility and safety of people and robots.

The use of **crowd-sourced deliveries** is an area of exploration and research. With this strategy, a person ordering and receiving a package via an online order could also receive a neighbor's package. The expectation is that the person would deliver the neighbor's package, and both parties would receive a discount on their orders for their agreement. This can save on delivery time and expense for the carrier, but it invites additional risk.

Establishing a **Low-Emission Zone (LEZ)** in dense urban areas could catalyze investments in sustainable urban freight strategies. Regulations could be introduced to LEZ initiatives compatible with existing regulations and sustainability directives. Alternatively, this could be voluntary and rely on incentives, as is the case in [Santa Monica](#). The same communities where cargo bikes would be appropriate are also candidates for LEZs. In addition, the AB 617 communities already identified for disproportionate exposure to and burden from air pollution would be candidates for demonstrating this strategy.

Advanced Air Mobility (AAM) technologies can complement freight movement by providing flexible deliveries, including last mile deliveries, while removing trucks from the roadway system. To date, AAM technology integration has been limited due to the continued and evolving development of aircraft as well as regulation of National Air Space, land use, and local permitting practices. Roles and responsibilities among government, industry, non-profits have yet to be defined. However, early pilots have proven functional use case scenarios that may be applicable at a larger scale. In 2017, for example, the San Diego Economic Development Corporation (SDEDC) led a successful pilot leveraging funds from the Federal Aviation Administration's Unmanned Systems Integrated Pilot Program (FAA IPP). SDEDC, in partnership with Matternet, UPS, and UC San Diego Health's Jacobs Medical Center, were able to launch an aerial delivery service of Unmanned Aerial Systems (i.e., drones) to deliver medical specimens to San Diego healthcare providers, improving delivery speed, reliability, and costs. In efforts to augment pilots from the FAA IPP, SANDAG partnered with the San Diego County Regional Airport Authority to plan for and integrate Advanced Air Mobility (AAM) into the regional transportation system. Funding provided through a Caltrans Sustainable Transportation Planning Grant will help establish a uniform vision for AAM technologies and identify near-term pilot opportunities that will alleviate transportation demands on the ground, including goods movement. As part of the project,

a collaborative will serve as a forum for discussion and information-sharing to guide the development of an AAM Policy Framework and Implementation Strategy for local jurisdictions. Resources produced may be adapted by other regions and inform local permitting practices, state policy, and efforts spearheaded by Caltrans Division of Aeronautics.

3.3 Infrastructure Improvements

Public agencies could consider expanding deployment of **Intelligent Transportation Systems (ITS)** technologies. Border crossing management systems, with advance warning of potential wait times, would be especially helpful for cross-border drayage operators and the freight sector in general. SANDAG is implementing the Regional Border Management System (RBMS), a component of the Advancing Border Connectivity (ABC) project funded through the Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) program, to integrate several strategies enabled by ITS, such as dynamic lane management, traveler information, border wait time estimation, and variable tolling through the SR 11/Otay Mesa East Port of Entry project. Variable tolling will maintain consistent wait times for travelers by charging higher tolls when demand rises. This will limit congestion at the POE and generate revenue to support the necessary repayment of infrastructure bonds. Future implementation of similar technologies to benefit goods movement include Smart Intersection Systems, which can coordinate traffic signals to keep trucks moving smoothly, and Mobility Hub amenities, which can allocate curb space for efficient commercial vehicle pickups and deliveries. Additional implementation of freight routing and trip time information throughout the region could make these technologies more useful for carriers.

Active Transportation and Demand Management (ATDM) technology enables transportation operators to modify how infrastructure and services are used based on changing traffic conditions. This also allows operators to make more use of existing roads and offers an alternative to costly road expansion. Real-time travel information helps drivers decide how, where, and when to travel to avoid congestion and dangerous driving conditions. Other components of SANDAG's ABC project will implement Integrated Corridor Management System functions. These will include changeable message signs and adaptive signal timing to help with re-routing in response to incidents on SR 905. The displayed detour and adaptive timing will include consideration for freight routes.

SANDAG has developed an ATDM Concept of Operations study for the I-805 South Corridor that includes strategies applicable to freight. Examples include dynamic lane assignment, queue warning systems, speed harmonization, actionable event information, and active dynamic routing. All these strategies take advantage of real-time information and communication to improve safety and operational efficiency. These benefits are especially

pronounced for trucks. Trucks are among the largest vehicles on the road and inherently create safety concerns at higher speeds. In addition, commercial vehicle travel is heavily dependent on the cost of truck driver labor. Therefore, rerouting trucks to avoid delays reduces the cost of moving goods and improves regional economic competitiveness.

The Port of Los Angeles was awarded an ATCMTD grant for its Gateway Project in August 2022. This project will implement cloud-based, artificial intelligence applications to help streamline and schedule the staging of cargo and empty returns. The application introduces new means to help direct cargo owners, truckers and drayage drivers and reduce congestion at the port. This and other ATCMTD projects are developing strategies with significant potential benefits for freight operations that may be applicable to San Diego and Imperial Counties in the future.

Dedicated truck lane proposals for freight corridors may be worth considering. In theory, truck lanes have the potential to reduce conflicts with passenger vehicles, improving safety and efficiency of truck operations. While these types of projects have been difficult to implement as described in the Task 3 Memorandum, there are examples in the broader region, including I-5 at the SR 14 split in Los Angeles County, Southbound I-5 at the SR 99 Junction near the Grapevine in Kern County, and SR 60 in Riverside County. Additional opportunities for deploying these types of technologies should be considered, particularly in less congested locations where right-of-way (ROW) is less constrained, such as SR 905 and SR 52. Dedicated truck lanes can also be employed at interchanges with significant truck traffic. Dynamic lane assignment and dynamic junction control technology could allow for temporary truck lanes when desired to assist with merging and adjust to real-time traffic conditions. This could be useful at the SR 52 Westbound to I-805 Northbound interchange or several interchanges along SR 78.

The Harbor Drive 2.0 project, which is advancing into environmental study, extends the dedicated truck lane concept to arterial streets through dedicated lanes and complementary ITS strategies such as **freight signal priority**. Additional arterial and POE strategies for truck prioritization can improve terminal access using RFID and other technologies. For example, a gate operating system and truck reservation system can decrease wait times at freight origins and destinations. Arterial strategies would be useful on other roads throughout the region with high truck volumes. Examples include Washington Street and Miramar Road in San Diego, Scripps Poway Parkway in Poway, and Palomar Airport Road in Carlsbad. Examples in Imperial County include SR 111, SR 78, SR 115, SR 98, and Forrester Road. The hardware and software infrastructure components necessary for these improvements should be identified for simplified and integrated implementation.

Financing dedicated, truck-only toll lanes would be reliant on high truck volumes and drivers' willingness to pay, so the option might be viable only in limited areas, primarily the

system bottlenecks on freight corridors. Some of the corridors identified are SR 905/I-805 Interchange, I-5/SR 163 Interchange, and I-5 from SR 54 to the SR 15 interchange. Implementation could be through the addition of standard highway lanes, or a “truck on shoulder” concept could be developed as a variation of the “bus on shoulder” service provided by the South Bay *Rapid* project on I-805 and SR 94. Once the Otay Mesa East POE is open to commercial vehicle traffic, there may be an opportunity for demonstrating truck-only toll lanes in the Otay Mesa area. Although many trucks crossing the border northbound are anticipated to have destinations in Otay Mesa, trucks destined for points further north could benefit from reliable through travel. A potentially significant truck route for the future is from Otay Mesa East POE to the Port of San Diego’s marine terminals and adjacent rail yards via SR 11, SR 905, and I-5, and Harbor Drive. Safe and reliable travel achieved through truck-only toll lanes between these gateways could encourage greater use of the route. Charging truck drivers for these toll lanes would be a simple means of implementation, but a public-private partnership involving shippers and receivers could also be explored. Finally, achieving the authority to implement this concept would be an important impediment to overcome.

Another consideration for public agencies and elected officials is to **expand managed lane** access to trucks. Although there would be hurdles to overcome, as documented in the 2013 SANDAG study “Analysis of Freeway Operational Strategies Related to the Use of Managed Lanes by Trucks,” a pilot project along I-15 could test the feasibility of this strategy in the San Diego region. Enabling this permanently would require hardware, infrastructure, and policy changes at the state level. Assuming the success of this pilot, the design of near-term managed lane projects on I-5 and SR 78 could incorporate lessons learned.

In the absence of managed lane access for trucks, there could still be a direct freight benefit to the expansion of managed lanes. SBCTA has proposed using excess toll revenues generated from managed lanes to create a Clean Truck Program with incentives for businesses to purchase clean (likely near-zero or zero-emission) trucks. This would provide a freight justification for managed lane projects and generate revenue for the desired conversion of truck fleets to zero-emission technologies. Prioritizing the use of excess revenue for incentives of this type would need to be weighed against funding transit operations and the expansion of the managed lane network.

A similar concept proposed by the Los Angeles County Metropolitan Transportation Authority (LA Metro) as part of its 2021 Goods Movement Strategic Plan is a Countywide Clean Truck initiative. This initiative calls for establishing a working group, developing an information clearinghouse, establishing revenue streams, developing criteria and metrics, and implementing the program on the I-710 corridor.

A strategy with potentially significant safety benefits is the reconsideration of existing **truck operations in work zone** plans and activities. The implementation of the Complete

Corridor projects will entail significant construction activities that will cause temporary disruptions to traffic. Some of these disruptions could be severe, and last many years, negatively affecting freight moving through the corridor and nearby communities. Traffic Control Plans for managing work zones typically do not explicitly accommodate the needs of trucks, leading to potentially dangerous conditions as lanes are narrowed and restriped and shoulders are eliminated. It is recommended that these plans be amended to consider the degree of freight traffic on corridors and associated needs. In addition, it is recommended that Caltrans implement smart technologies in these zones to allow real-time communications with the vehicle operators.

Freight Clusters, where transportation-dependent industries locate proximate to freight infrastructure, are an opportunity to achieve efficiencies and scale. The Imperial Valley Economic Development Corporation (IVEDC) is planning a zero-emissions inland port in the northern portion of Imperial County. Located on 5,000-6,000 acres, it would include a cluster of distribution centers with the ability to serve 11 western states within 24 hours. The facility would also include some light to medium manufacturing. IVEDC is in the process of land acquisition and would then move to environmental review with a targeted opening in approximately 5 years.

Similar opportunities to develop **intermodal facilities** in northern Imperial County and near Calexico could also be explored. These could support lithium extraction and other industries in the border region by presenting alternative and more efficient transportation options. However, more detailed study of commodities, origins, destinations, and infrastructure would be needed.

The impacts of climate change on transportation infrastructure critical for goods movement will be especially important for the future. Climate stressors such as storm surge, erosion, tsunamis, flooding, and sea level rise are likely to impact vulnerable facilities like Harbor Drive in San Diego Bay. SANDAG's [Military Installation Resilience Transportation Corridor Report](#) will provide project recommendations specific to the San Diego region's military installations, but certain projects are also likely to be applicable for goods movement. This is because marine terminals, rail yards, arterials, and highways are located close to the military installations and near the water. [Comprehensive Multimodal Corridor Plans](#) (CMCPs) are also being developed along each corridor in the region to identify specific projects to address **climate adaptation**. There should be special attention paid to implementing improvements on goods movement routes to ensure resilience in the event of disruptions.

4. APPENDIX: PROJECT MAPS

Orange County

Riverside County

Torres-Martinez Reservation

Pechanga Reservation

Pala Reservation

Pauma and Yuima Reservation

Camp Pendleton

Los Coyotes Reservation

Oceanside Vista

La Jolla Reservation

76

Rincon Reservation

Santa Ysabel Reservation

Carlsbad

San Marcos

Escondido

Mesa Grande Reservation
















78

5

Encinitas

Inaja and Cosmit Reservation

Vulnerable Communities

-  AB 617 Communities
-  Most Vulnerable Communities
-  Vulnerable Communities
-  Goods Movement
-  Complete Corridors
-  Transit Leap
-  Rail Projects
-  Road Projects
-  Seaport
-  Airport
-  Port of Entry
-  Railroads
-  Study Area County Boundaries
-  Interstate
-  State Route

Solana Beach

Del Mar

Poway

67

Barona Reservation

Capitan Grande Reservation

79

805

San Diego

56

52

Viejas Reservation

Ewilaapaayp Reservation

Manzanita Reservation

163

SanTEE

Sycuan Reservation

La Posta Reservation

8

El Cajon

Jamul Indian Village

Campo Reservation

94

La Mesa

Lemon Grove

Chula Vista

National City

Imperial Beach

Tijuana

282

94

54

125

188

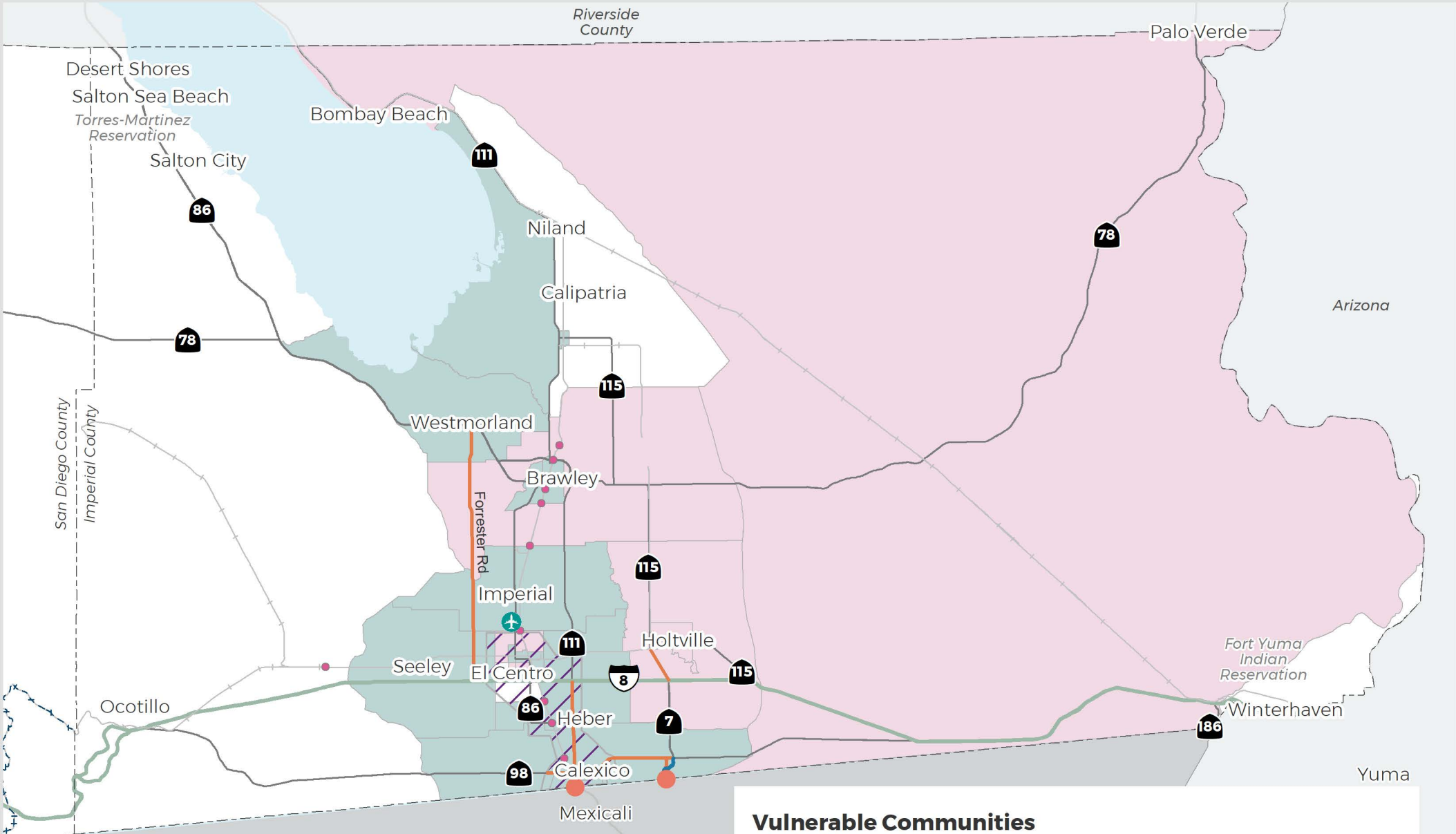
Tecate

905














Baja California, Mexico



San Diego County
Imperial County



Vulnerable Communities

-  AB 617 Communities
-  Most Vulnerable Communities
-  Vulnerable Communities
-  Goods Movement
-  Roadway Access
-  Grade Separations
-  Seaport
-  Airport
-  Port of Entry
-  Railroads
-  Study Area County Boundaries
-  Interstate
-  State Route



ADDENDUM TO SAN DIEGO AND IMPERIAL COUNTIES SUSTAINABLE FREIGHT IMPLEMENTATION STRATEGY: FINAL INNOVATIVE STRATEGIES SCREENING MEMORANDUM

This addendum reflects a modification to the Final Innovative Strategies Screening Memorandum. On Table 1 – Scoring of Benefits, the scoring scale was originally 1 – 10. This approach was developed by the Project Development Team (PDT), presented to the Freight Stakeholders Taskforce, and included in the Final Existing Conditions and Sustainable Freight Best Practices Memorandum. While working through the process of assigning scores, the project development team noted that a smaller scale would be more appropriate, given the conceptual nature of projects, programs, and policies being evaluated. The updated range for scoring, as indicated below, is between 1 and 3. The weighting of areas are unchanged.

Modified text is shown as underlined.

Changes to p. 2

Table 1: Scoring of Benefits

Areas	Criteria	Scoring	Weighting
Environment	Impact on reducing emissions of GHGs	1 - <u>3</u>	35%
	Impact on reducing emissions of criteria pollutants (particulate matter, NO _x , VOC, etc.)	1 - <u>3</u>	
Equity	Degree to which benefits accrue to most vulnerable communities (Top 25% of CalEnviroScreen 4.0 scores, or AB 617), and vulnerable communities (Top 50% of CalEnviroScreen 4.0 scores, or Tribal Land), including safety considerations	1 - <u>3</u>	35%
Economy	Improves efficiency (speeds and reliability) of freight transportation system	1 - <u>3</u>	30%
	Improves capacity of freight system to accommodate expected increases in freight	1 - <u>3</u>	

Appendix D:

Public Outreach Plan Memorandum



SAN DIEGO AND IMPERIAL COUNTIES SUSTAINABLE FREIGHT IMPLEMENTATION STRATEGY - PUBLIC OUTREACH PLAN

May 2022

Project Overview

Freight and goods movement represents a critical lifeline to the overall economy and a source of good jobs in the San Diego and Imperial Counties region. Recent bottlenecks and workforce challenges related to COVID-19 illustrate how dependent our economy is on the smooth delivery of goods, and the ramifications if this is compromised. In addition, jobs serving the freight and goods movement industry can be well-paying and reliable, ranging from stevedores to truck drivers and warehouse workers, as well as a range of related industries that support the movement of freight.

However, the freight and goods movement industry is largely dependent on diesel-driven equipment, or in the case of ships, heavy fuel oil, that have historically not been subject to the same emissions controls as passenger vehicles and therefore are more polluting. In addition to the ships themselves, there is an abundance of equipment associated with servicing and offloading vessels, further compounding the issue. The international nature of the region's trade, industry, and agriculture is another factor to be considered. The maquiladora model, where parts are supplied to manufacturing facilities in Mexico and shipped back into the U.S. as finished products, is a vibrant and valuable industry that is dependent on a reliable freight infrastructure. The same can be said of agriculture on both sides of the border.

By its nature, freight and goods movement is concentrated in certain areas of the region, including near the Port of San Diego and the U.S.-Mexico border. As a result, adjacent communities bear a disproportionate burden when it comes to air pollution. Those communities of concern are typically lower income and populated by ethnic minorities. Awareness of environmental justice has highlighted this fact and demands that the inequities be addressed. However, the freight and goods movement industry offers well-paying jobs, potentially providing opportunities to communities of concern. Therefore, efforts to lessen the disproportionate burden these assets impose on disadvantaged communities must be balanced with the economic benefits they provide.

The Sustainable Freight Implementation Strategy for San Diego and Imperial Counties project will seek to preserve or enhance the competitiveness of freight infrastructure while reducing environmental and health impacts. Specific outcomes of the Strategy include the following:

- Regional momentum and consensus
- Stronger partnerships
- Vision statement and implementation plan
- Multimodal freight projects and policies that assist goods movement
- Feasibility of emerging sustainable freight projects and policies
- Framework for sustainability, efficiency, and economic competitiveness
- Data-driven vetting of projects
- Updated list of projects and policies that reduce GHG while fostering trade
- Funding opportunities
- Workforce development toolkit

Developing this Strategy will require input from a range of stakeholders. This input will both inform the Strategy and will also create buy-in from important stakeholder groups and residents, ensuring popular support, to the degree that is possible.

Stakeholder groups that should be engaged can include federal, state and local transportation and resources agencies, freight operators, logistics companies, business organizations, economic development entities, workforce development organizations, environmental non-profits, and community-based organizations.

Outreach Goals

The purpose of the public outreach campaign will be to support the development of the Implementation Plan (Task 6). Strategies identified in Tasks 3 and 4 will be paired with feedback from the public to develop the framework for how existing and new sustainable freight projects, programs, and policies can be advanced in the region.

The goals for the outreach plan include the following:

- Spark honest conversations about community impacts of freight and find a way forward for sustainable freight movement.
- Maximize broad and representative participation in the study. This will be accomplished by using an integrated approach that will begin with those stakeholders most familiar with the issues, working outwards until the general population is eventually engaged.
- Ensure all communities have a voice, including historically marginalized communities that typically are not involved in transportation planning initiatives. Special efforts will be made to work with organizations and individuals trusted by these communities.

Study Area

The area of study will include communities adjacent to major freight facilities in San Diego and Imperial Counties. Environmental justice areas, as defined by AB 617, will be a particular focus and include the Portside Environmental Justice Communities, the International Border Community, and the Calexico-El Centro-Heber corridor. Communities within these areas include the following:

- Barrio Logan
- Otay Mesa
- National City
- San Ysidro
- Chula Vista
- Logan Heights
- Calexico
- Heber
- El Centro

Outreach Methods

The outreach methodology is designed to work in a well-structured process where the earlier research informs subsequent steps, forming “Concentric Circles of Influence” with each step reaching outward more broadly than the last. The initial research is focused on gathering information from those closest to the issue who have a technical understanding of freight movement, its place in the economy, and its effects on communities. Subsequent phases cast a broader net, until finally the general public and residents of historically marginalized communities are engaged.

Target stakeholders include industry leaders, businesses, elected officials, government entities, community groups, residents, and others. Further details are provided below. All outreach strategies and supporting materials will be provided in Spanish and English, and the team will work closely with trusted community partners to ensure underserved communities have a voice.

Stakeholders who have been identified include the following:

Goods Movement

- Burlington Northern and Santa Fe (BNSF) Railroad
- Union Pacific (UP) Railroad
- California Truckers Association – San Diego/Imperial Chapter
- San Diego Port Tenants Association
- National Customs Brokers and Freight Forwarders Association
- Air cargo handler, such as FedEx, UPS, or San Diego County Regional Airport Authority

Tribal Nations

- Barona Band of Mission Indians
- Campo Band of Mission Indians
- Ewiiapaayp Band of the Kumeyaay Nation
- Inaja-Cosmit Band of Indians
- Jamul Indian Village of California
- La Jolla Band of Luiseño Indians
- La Posta Band of Mission Indians
- Lipay Nation of Santa Ysabel
- Los Coyotes Band of Cahuilla and Cupeño Indians
- Manzanita Band of the Kumeyaay Nation
- Mesa Grande Band of Mission Indians
- Pala Band of Mission Indians
- Pauma Band of Luiseño Indians
- Rincon Band of Luiseño Indians
- San Pasqual Band of Diegueño Indians
- Sycuan Band of the Kumeyaay Nation
- Viejas Band of Kumeyaay Nation

Environment

- Environmental Health Coalition
- Comité Cívico del Valle
- Imperial County Air Pollution Control District
- San Diego County Air Pollution Control District
- California Coalition for Clean Air
- California Air Resources Board (CARB)

Economic Development

- San Diego Regional Economic Development Corporation
- Imperial Valley Economic Development Council
- Otay Mesa Chamber of Commerce
- Greater Brawley Chamber of Commerce – Calexico Office
- California Governor's Office of Business and Economic Development

Workforce Development

- San Diego Workforce Partnership
- San Diego Community College District
- Eastern Kentucky University (Global Supply Chain - online)
- American Military University (Transportation and Logistics Management - online)
- Association for Supply Chain Management (online)
- Imperial County Workforce Development Board
- Imperial Valley College

- Imperial Valley Regional Occupational Program
- United Truck Driving School
- Council of Supply Chain Management Professionals (local roundtable)
- US Navy
- Cross border workforce/goods movement partnerships
- San Diego Unified: College Career and Technical Education

Labor Unions

- Teamsters 542
- Teamsters 683
- ILWU 29
- International Brotherhood of Boilermakers
- Warehouse Workers United
- Teacher Unions serving school in AB 617 communities

Medical Professionals

- San Diego Pediatricians for Clean Air
- Climate Action Campaign Public Health Advisory Council
- SEIU- Committee of interns and Residents

Other Community-Based Organizations

- San Diego Organizing Project (SDOP)
- San Diego Black Workers Center
- Center on Policy Initiatives (CPI)
- Mundo Gardens
- Olivewood Gardens and Learning Center
- Paradise Creek Educational Park, Inc
- San Ysidro Health Center
- Community Housing Works
- Alliance of Californians for Community Empowerment (ACCE)
- MAAC Project
- Chicano Federation

To achieve the goals above, stakeholder engagement will include up to ten interviews, four focus groups/workshops, and a survey.

Stakeholder Interviews

A small number of stakeholder interviews will be conducted early in the project (May and June 2022) to understand the broader contextual issues in which the Sustainable Freight Strategy is being developed. The interviews will also be used to identify new sustainable freight strategies and refine and prioritize existing ones to be carried forward into the

implementation plan. The research will describe how people currently see the situation regarding freight and sustainability and what they would like to be considered in the plan.

Stakeholder interviewees may include freight industry organizations, environmental advocates, community organizations, business organizations, and regional and state agencies, and tribal nations. Due to the difficulty of obtaining private industry stakeholder participation in on-going committees, a concerted effort will be made to interview several freight shippers and carriers.

A questionnaire for these interviews will be developed and submitted to SANDAG for approval. The questionnaire will act as a guideline, providing the interviewer with a framework that can be tailored to each interviewee. The questionnaire will include a summary of the current challenges, opportunities, and policies surrounding freight and goods movement in the region so a basis for meaningful discussion can be established between the interviewer and interviewee. The nature of these interviews will be open-ended, encouraging interviewees to share as much information as possible to inform the focus groups phase of the study and final outreach report.

Focus Groups

Focus groups will be conducted midway through the project (Fall-Winter 2022) with participants identified based on stakeholder interviews and other research. Focus groups will be organized to provide input around the existing conditions and innovative solutions that were identified in previous research and before more in-depth research is conducted. Focus groups can be organized around issues to include the following:

Focus Group 1:

San Diego County

- Environmental organizations
- Health Organizations/ Medical Professionals
- Community Organizations

Focus Group 2:

Imperial County

- Environmental organizations
- Health Organizations/ Medical Professionals
- Community Organizations

Focus Group 3:

- Workforce development organizations
- Labor groups

Focus Group 4:

- Freight industry representations
- Businesses organizations – chambers, economic development agencies

The consultant team and SANDAG will ensure representative participation through the following tactics:

- Focus groups can be held virtually and/or in person, depending on the group being engaged.
- Participation in the focus groups will be driven through trusted partners, such as stakeholder groups, as well as environmental and community groups.
- The focus groups will be held at times that are convenient for the majority of participants.
- Real time Spanish-language translation will be provided.

Other considerations:

- A slide presentation will be developed for each focus group to provide background on the topic, viable solutions, and to pose questions for discussion.
- The focus groups will be moderated by a facilitator and presentations will be made by the consultant team (WSP) and SANDAG staff.
- A sign-in sheet will record who attended and their contact information.
- The optimal format for the focus groups will be determined when more is understood about the material to be presented, the information to be collected, and each audience. This could include breakout groups, stations dedicated to certain topics, or audience-style meetings.
- The survey described below can also be promoted at the focus groups to boost participation.
- A wrap-up report of the focus groups will summarize the input and document who attended.

Working Group

SANDAG's Freight Stakeholder Taskforce (FSTF) will be engaged as the primary advisory committee throughout the project. Imperial County Transportation Commission (ICTC) and additional San Diego County stakeholders will be added to the distribution list of FSTF for the duration of the project. This advisory committee provides input to the development of freight planning efforts throughout the region. It is comprised of public and private freight stakeholders, including entities responsible for freight planning and freight project development, resource agencies, transportation agencies, and industry representatives. The FSTF will provide input on all major project deliverables at approximately eight meetings during the project.

Standing Committees

Outreach efforts will also engage standing committees and working groups. Outreach will include the following and will be primarily conducted by SANDAG staff.

SANDAG

- Social Equity Taskforce
- Sustainable Communities Working Group
- Tribal Transportation Taskforce
- Committee on Binational Regional Opportunities (COBRO)

External

- Imperial-Mexicali Binational Alliance (IMBA)
- AB 617 - International Border Community
- AB 617 - Portside Environmental Justice
- AB 617 - Calexico, El Centro, Heber

The consultant team and SANDAG will also coordinate with San Diego Regional MD/HD ZEV Blueprint (Blueprint) project regularly throughout the project

Survey

A public survey will be conducted to focus on the general public with special efforts made to ensure participation from underserved communities heavily impacted by freight and goods movement. Information from the stakeholder interviews and focus groups will identify topics the general public should be engaged on. The survey questionnaire will obtain feedback on goals and needs for the strategy and enable a better understanding of the concerns and preferences of those most directly affected by its implementation. The input will be used to help evaluate and refine projects, programs, and policies.

Survey participants will be from the general public, underserved communities, those heavily impacted by freight, the freight industry, and other target audiences.

The consultant team will drive participation in the survey by partnering with trusted community-based organizations (CBOs). These can include groups such as the Environmental Health Coalition, community healthcare workers (promotores), San Diego Black Workers Center, Center on Policy Initiatives, Paradise Creek Educational Park, Inc., Alliance of Californians for Community Empowerment, Chicano Federation, Comité Cívico del Valle and others in San Diego and Imperial counties. The consultant team will partner with these trusted CBOs to disseminate the survey and encourage participation by framing the value to the community.

Other tactics for promoting the survey will include a press release to drive media coverage, coordination through elected officials and public agencies, email notifications, social media, distribution at key community functions and meetings, and notifications through other partner organizations.

The survey will be made available in English and Spanish. In addition, print copies will be circulated by community partners for populations with low digital connectivity or literacy. Digital versions of the survey will also be made available and posted on the website.

Key Messages

The development of key messages is critical in communicating the vision of the Strategy and to inform stakeholders, focus group, and survey participants. Key messages (not listed in order of priority) include the following:

- SANDAG highly values input from the community, businesses, workers, and agencies about how to achieve emissions goals.
- The freight industry is vital to the economy and provides good jobs for the region.
- Freight creates emissions.
- The State of California has aggressive emissions reductions goals.
- Reducing emissions from freight transportation is good for the health of communities.
- Marginalized communities are historically more impacted by goods movement and can share perspectives on how to re-envision a healthier, sustainable, and equitable goods movement.
- Sustainable and reliable freight and goods movement is dependent upon workforce development.
- Sustainable freight movement is achievable through study, planning, community engagement, and innovative solutions.

Communications Materials

Supporting materials will serve to educate audiences, provide background information, direct users to other assets for more information, and encourage further participation in outreach tactics, such as the survey and focus groups. Channels and materials will include:

Website content

- Project background
- Information repository
- Fact sheet
- Previous studies
- Links to agencies studying the issue

- Previous reports
- Summaries from focus groups
- Link to survey to take online
- Survey results and other findings
- Contact information
- Comment form

Fact sheet

- Background on study
- Study goals
- Study area
- Contact information

PowerPoint

- Will be utilized for focus groups
- Will contain project background and context
- Information on existing needs and issues and potential strategies
- Q&A time

Handouts

- Will be utilized for focus groups and stakeholder interviews
- Similar information to fact sheet and PowerPoint
- Map and other graphics
- Project goals and timeline

Outcomes

The consultant team will provide an overarching summary report and synthesis of the public outreach described above, including stakeholder interviews, focus groups, and the survey.

Timeline and Milestones

Engagement milestones include:

- Stakeholder Interviews – May 2022 – June 2022
- Final Interview Summary – July 20, 2022
- Focus Groups – December 2022
- Field Survey – December 2022 – January 2023
- Final Focus Group Summary – January 27, 2023
- Final Survey Summary – February 24, 2023
- Final Outreach Summary – March 15, 2023

- Final Workshop Meeting Focused on Working Group and other stakeholders – September 2023
- Final Presentation Materials – November 23, 2023

Note: This document is subject to change as the project and public outreach efforts develop.

Appendix E:

MetroQuest Survey Summary



SAN DIEGO AND IMPERIAL COUNTIES SUSTAINABLE FREIGHT IMPLEMENTATION STRATEGY

FINAL SURVEY SUMMARY

May 2023

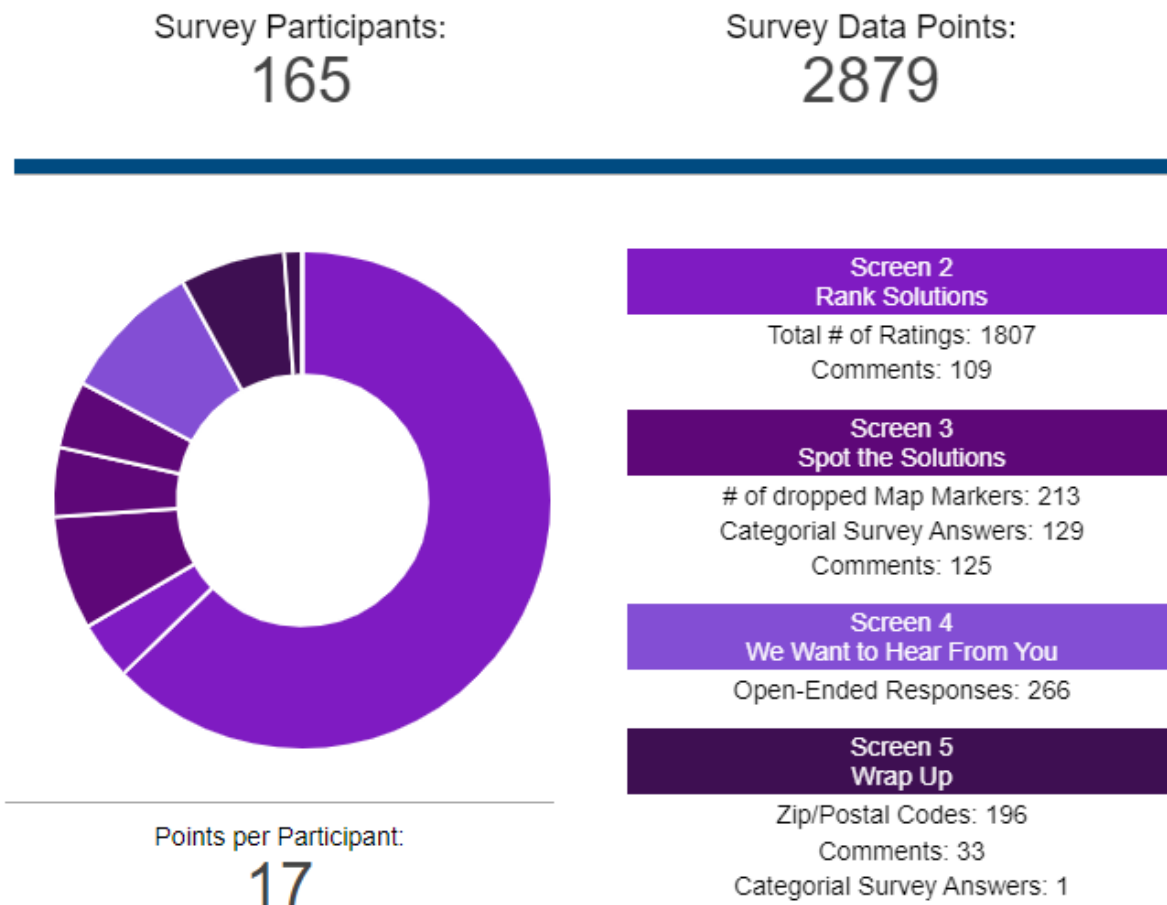
1.	Purpose and Scope	3
2.	Survey Data.....	6
2.1	Short Answer	6
2.2	Strategy Ranking	6
2.2.1	Reimagine How Highways/Roads Are Used	7
2.2.2	Sustainable Upgrades	9
2.2.3	Rerouting Truck Trips and Parking.....	11
2.3	Map Markers.....	15
2.3.1	How Highways/Roads Are Used	16
2.3.2	Sustainable Upgrades	17
2.3.3	Rerouting Truck Trips & Parking	19
2.3.4	Other Solutions.....	20
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1. PURPOSE AND SCOPE

A survey was fielded to obtain community input regarding freight issues and gauge preferences and priorities toward multimodal improvements under consideration in the San Diego and Imperial Counties Sustainable Freight Implementation Strategy (Strategy).

The survey was open to the public between March 18, 2023, and April 27, 2023. A total of 165 individuals participated in the survey. The survey was promoted on SANDAG and Imperial County social media sites and distributed to Community Based Organizations (CBOs) with dedicated efforts made to engage CBOs in Assembly Bill (AB) 617 communities and Tribal leaders. The survey platform was established using MetroQuest, a company that specializes in online public engagement for urban and transportation projects.

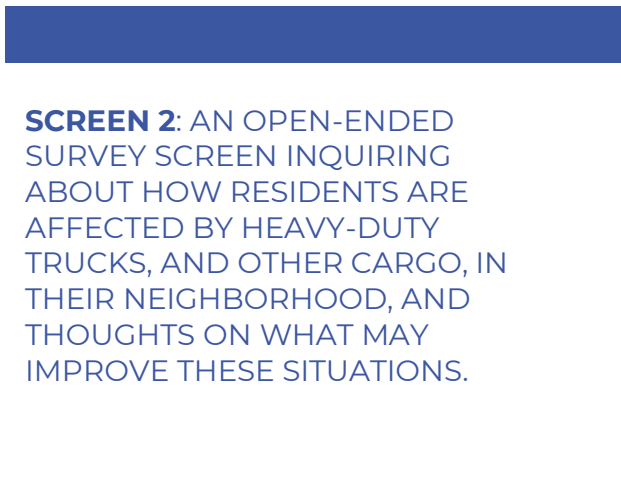
A snapshot of the total survey responses and responses by survey screen can be seen below.



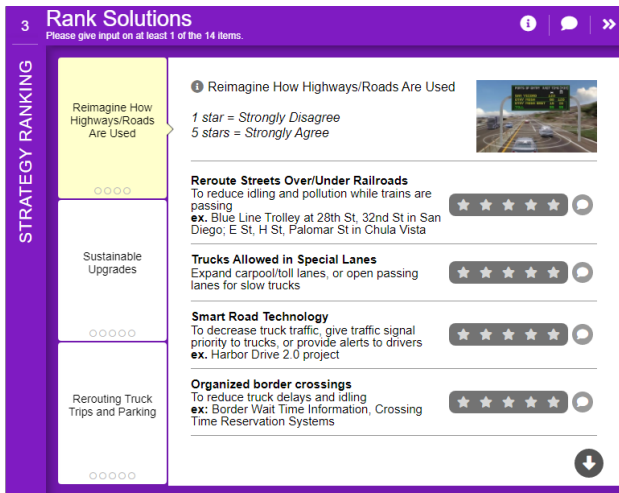
The MetroQuest survey was comprised of five survey screens, as shown, and described below. Responding to each screen and the corresponding questions was optional, and participants did not have to interact with every question on every screen.



SCREEN 1: A WELCOME SCREEN PROVIDED AN OVERVIEW OF THE STUDY AN THE PURPOSE OF THE SURVEY.

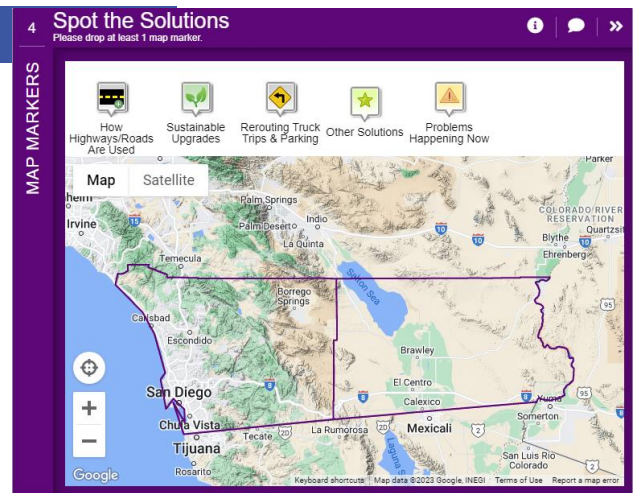


SCREEN 2: AN OPEN-ENDED SURVEY SCREEN INQUIRING ABOUT HOW RESIDENTS ARE AFFECTED BY HEAVY-DUTY TRUCKS, AND OTHER CARGO, IN THEIR NEIGHBORHOOD, AND THOUGHTS ON WHAT MAY IMPROVE THESE SITUATIONS.

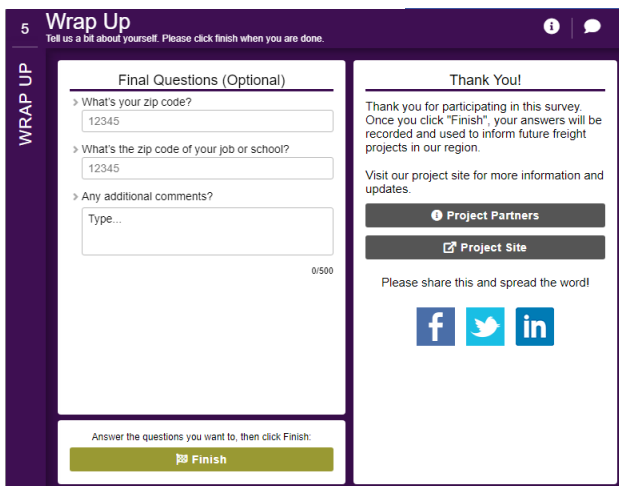


SCREEN 3: A STRATEGY RANKING SCREEN INFORMED PARTICIPANTS ABOUT A RANGE OF FREIGHT SOLUTIONS GROUPED BY THREE CATEGORIES. PARTICIPANTS WERE ABLE TO RATE THEM, 1-5, AND PROVIDE ADDITIONAL COMMENTS ON EACH CONCEPT.

SCREEN 4: A MAP MARKER SCREEN ASKED PARTICIPANTS TO IDENTIFY CHALLENGES AND OPPORTUNITIES IN SPECIFIC LOCATIONS WITHIN THE STUDY AREA; MULTIPLE ENTRIES BY ONE RESPONDENT WERE POSSIBLE.



SCREEN 5: A SUMMARY SCREEN ASKED FOR PARTICIPANTS' DEMOGRAPHIC DATA AND PROVIDED INFORMATION ON PROJECT UPDATES.



2. SURVEY DATA

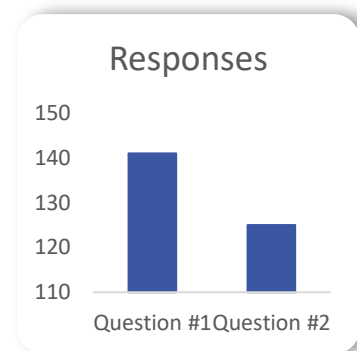
2.1 Short Answer

Screen 1 of the online survey provided a brief overview of the project and purpose of the study. Screen 2 asked participants first to point out existing problems in communities due to freight activity. They were instructed to respond to two short answer survey questions. The first question asked participants to discuss current neighborhood conditions about freight. To gain more actionable insights, the question followed with an opportunity to offer thoughts on potential solutions. The questions and distribution of answers are listed below.

1. How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?

Out of 141 responses, the following were mentioned:

- Noise (31 mentions)
- Traffic (25 mentions)
- Air quality (28 mentions)
- Parking (22 mentions)



2. What do you think might improve these problems?

Out of 125 responses, the following were mentioned:

- Reduce/Limit Truck Movement Zones and Times (21 comments)
- Electric vehicles (9 mentions)
- Added Rail & Rail Infrastructure (7 comments)
- More trucking infrastructure - e.g., wider roads, added off-ramp, freeway-cap (5 comments)

2.2 Strategy Ranking

Screen 3 of the online survey asked participants to rate potential solutions to improve freight movement in the region. The potential solutions were separated into three categories, each of which contained four to five solutions. Participants were asked to rate their opinion of a proposed solution on a scale between one and five stars and, if desired, to provide additional details in the comment balloons. A score of one star corresponded to strong disagreement with the proposed solution, whereas a score of five stars corresponded to strong agreement. Participants were only required to rate at least one solution but were able to respond to as many as they wanted.

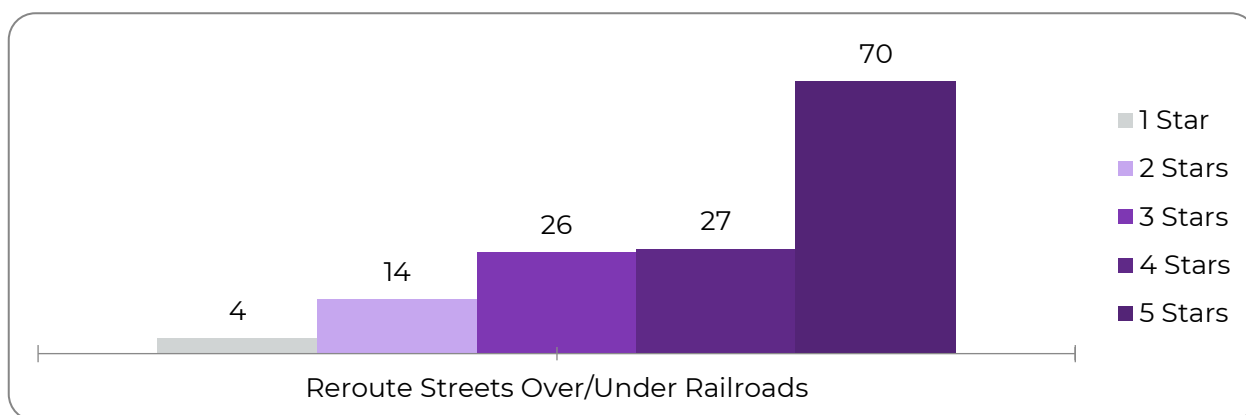
Number of Responses per Category:

Category	Total Responses
Sustainable Upgrades (5 solutions)	649
Rerouting Truck Trips and Parking (5 solutions)	630
Reimagine How Highways/Roads Are Used (4 solutions)	528

2.2.1 Reimagine How Highways/Roads Are Used

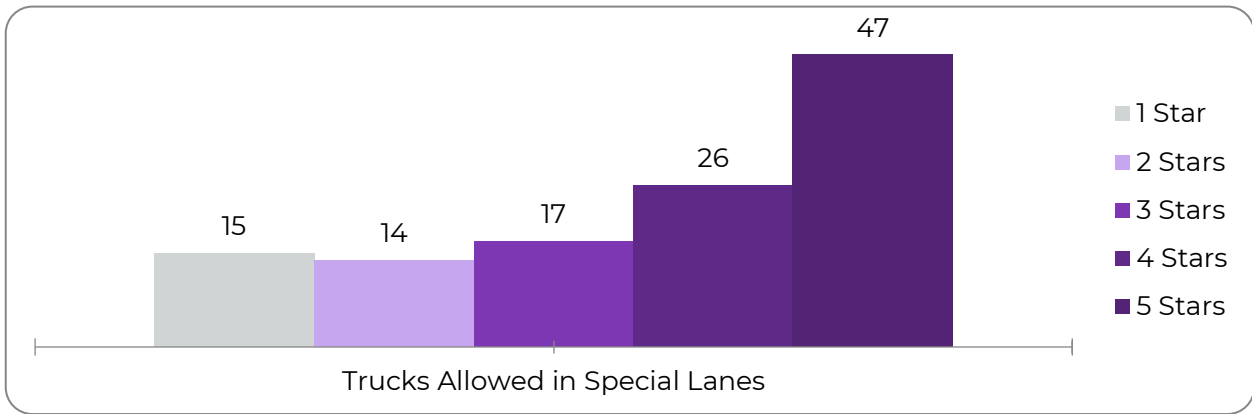
There was a total of 528 responses in the *Reimagine How Highways/Roads Are Used* category. The average response for the four potential solutions was 3.83, and the highest averages were for *Rerouting Streets Over/Under Railroad* and *Organized Border Crossings* solutions.

Reroute Streets Over/Under Railroads



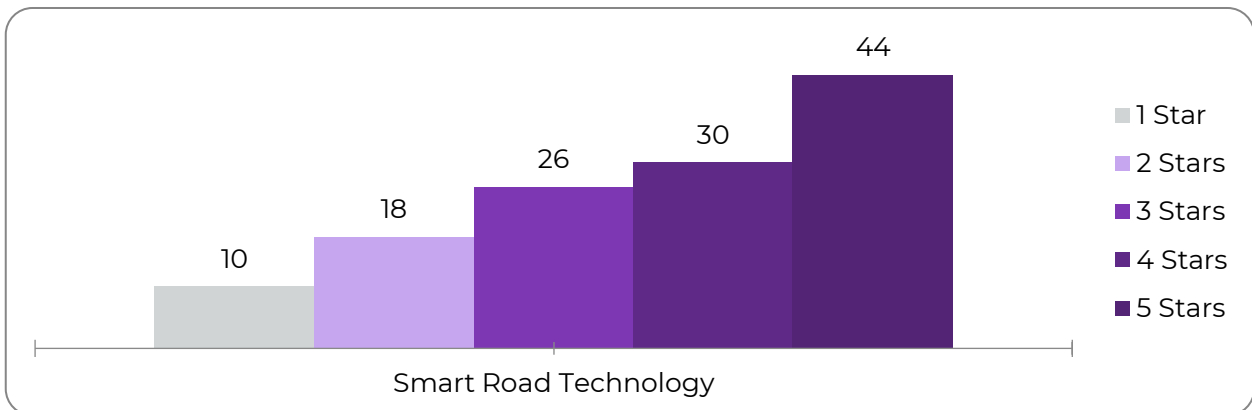
There was a total of 141 responses in the *Reroute Streets Over/Under Railroads* strategy. The average response was 4.03. Roughly 50% of responses were those who strongly agree (5 stars) with *Reroute Streets Over/Under Railroads* as a solution. 87% were neutral (3 stars) or above. Themes include prioritizing grade separations for freight and passenger rail corridors, near residential neighborhoods, and trolley stations.

Trucks Allowed in Special Lanes



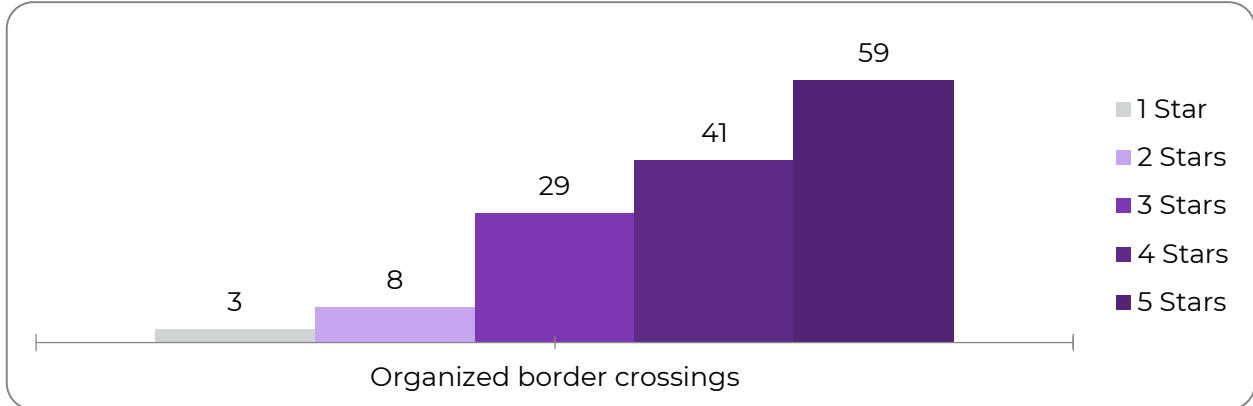
There was a total of 119 responses in the *Trucks Allowed in Special Lanes* strategy. The average response was 3.64. Roughly 39% of responses were those who strongly agree (5 stars) with *Trucks Allowed in Special Lanes* as a solution. 12% were strongly opposed (1 star). Themes include tolling all lanes, concerns about capacity for a truck lane, and desire to keep carpool and truck lanes separate.

Smart Road Technology



There was a total of 128 responses in the *Smart Road Technology* strategy. The average response was 3.64. Roughly 34% of responses were those who strongly agree (5 stars) with Smart Road Technology as a solution. 78% were neutral (3 stars) or above. Themes include supplying signal priority, optimizing traffic signals, and opposition to freight having special privileges.

Organized Border Crossings

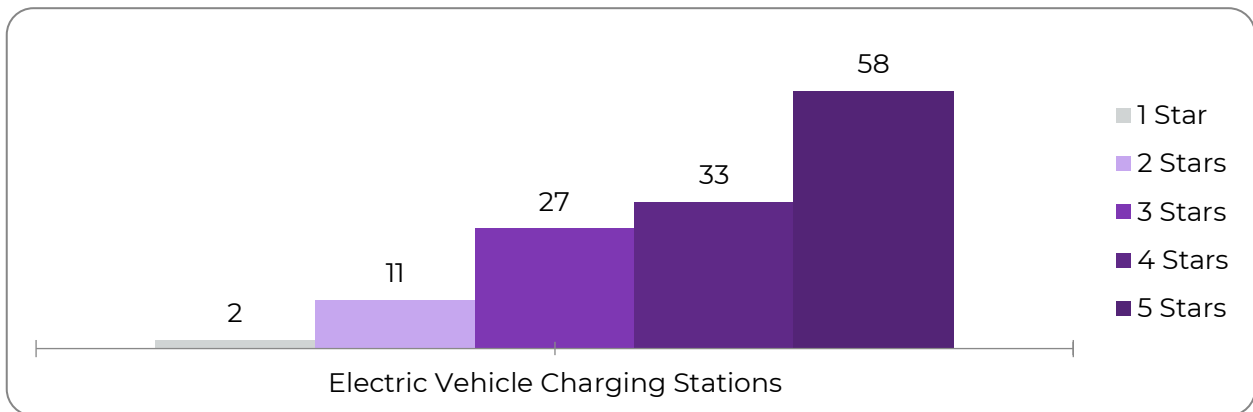


There was a total of 140 responses in the *Organized Border Crossings* strategy. The average response was 4.04, the highest average in this category. Roughly 42% of responses were those who strongly agree (5 stars) with *Organized Border Crossings* as a solution. 92% were neutral (3 stars) or above. Themes include supplying specific freight lanes at border crossings.

2.2.2 Sustainable Upgrades

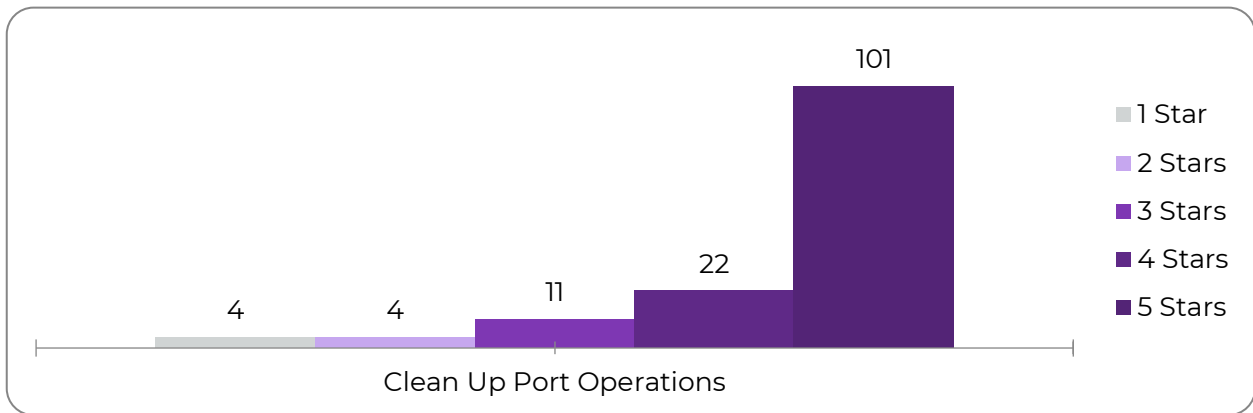
There was a total of 649 responses in the *Sustainable Upgrades* strategy. The average response for the four potential solutions was 4.19, and the highest averages were for *Clean Up Port Operations* and *Add Train Capacity*.

Electric Vehicle Charging Stations



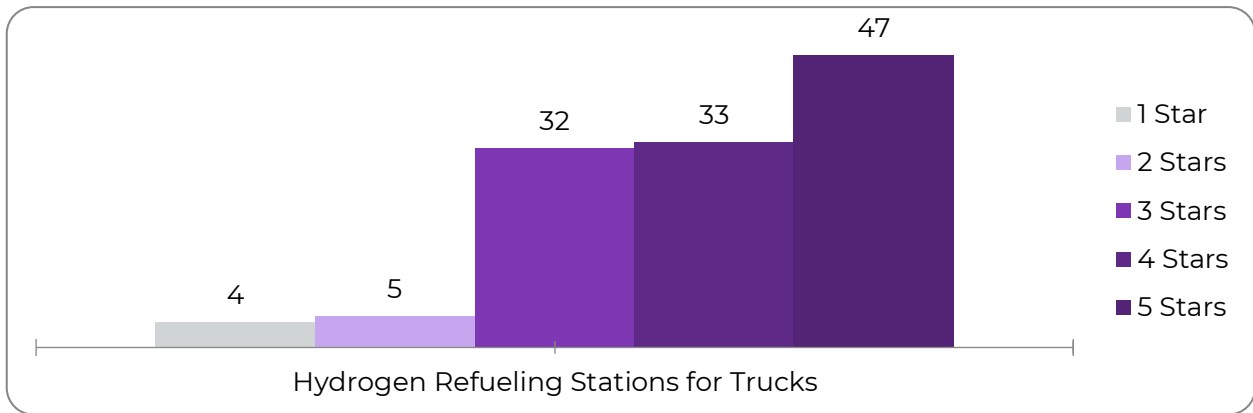
There was a total of 131 responses in the *Electric Vehicle Charging Stations* strategy. The average response was 4.02. Roughly 44% of responses were those who strongly agree (5 stars) with *Electric Vehicle Charging Stations* as a solution. Only 9% were opposed to the idea (2 stars) or below. Themes include concerns that electric vehicles will not be enough as a sole solution, and range anxiety.

Clean Up Port Operations



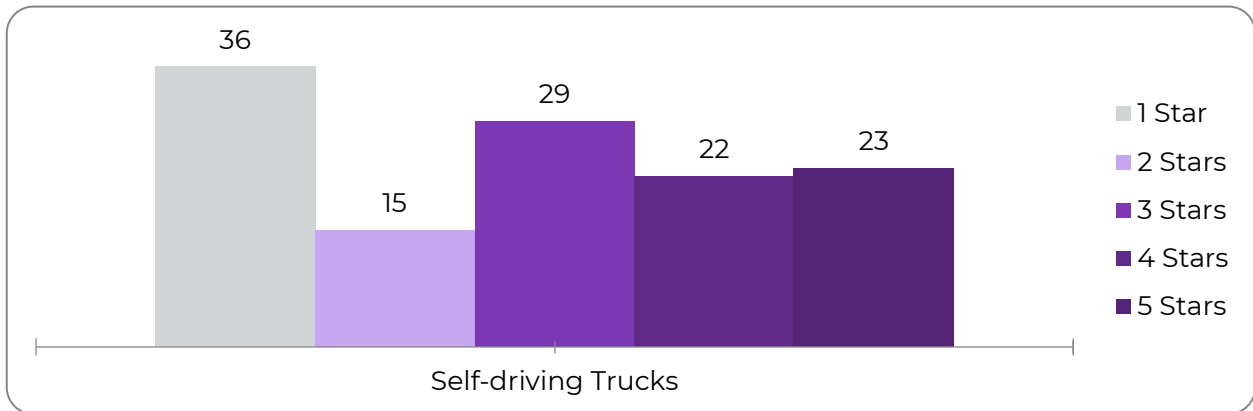
There was a total of 142 responses in the *Clean Up Port Operations* strategy. The average response was 4.49, the highest average in any category. Roughly 71% of responses were those who strongly agree (5 stars) with *Clean Up Port Operations* as a solution. 94% were neutral (3 stars) or above. Themes include prioritizing these efforts in historically disadvantaged communities and dense neighborhoods.

Hydrogen Refueling Stations for Trucks



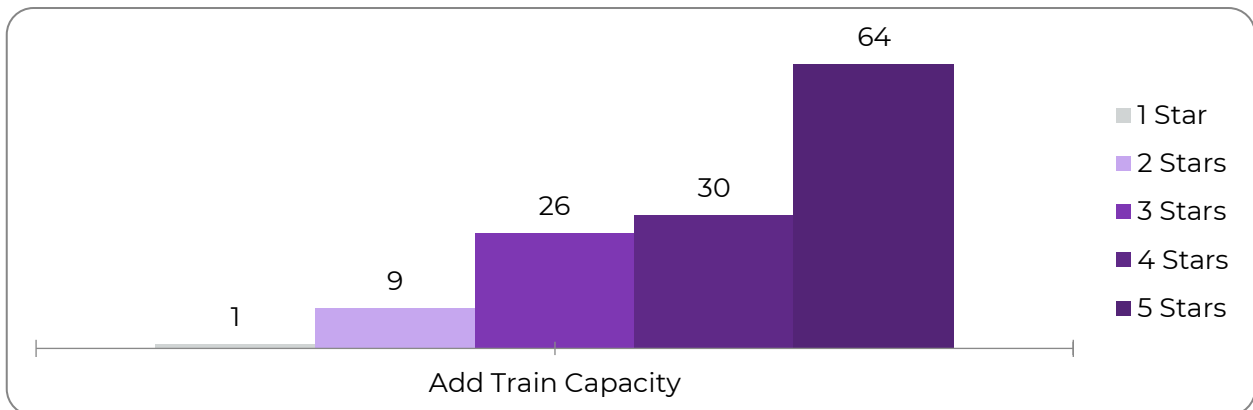
There was a total of 121 responses in the *Hydrogen Refueling Stations for Trucks* strategy. The average response was 3.94. Roughly 39% of responses were those who strongly agree (5 stars) with *Hydrogen Refueling Stations for Trucks* as a solution. 93% were neutral (3 stars) or above. Themes were primarily centered around concerns about the negative effects of hydrogen production.

Self-Driving Trucks



There was a total of 125 responses in the Self-Driving Trucks strategy. The average response was 2.85, the lowest average in any category. Roughly 29% of responses were those who strongly oppose (1 star) *Self-Driving Trucks* as a solution. 64% were neutral (3 stars) or lower. Themes include distrust for self-driving technology, and concerns about whether the technology will properly assess pedestrians and cyclists.

Add Train Capacity

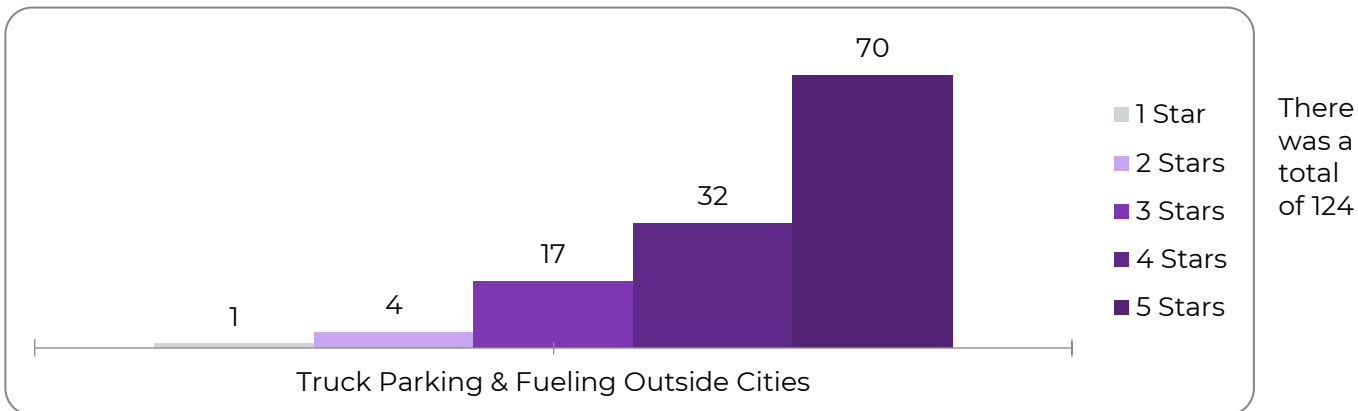


There was a total of 130 responses in the *Add Train Capacity* strategy. The average response was 4.13. Roughly 49% of responses were those who strongly agree (5 stars) with *Add Train Capacity* as a solution. 92% were neutral (3 stars) or above. Themes include rail being a proven method of traffic and pollution reduction and working with Baja, California to modernize regional rail infrastructure.

2.2.3 Rerouting Truck Trips and Parking

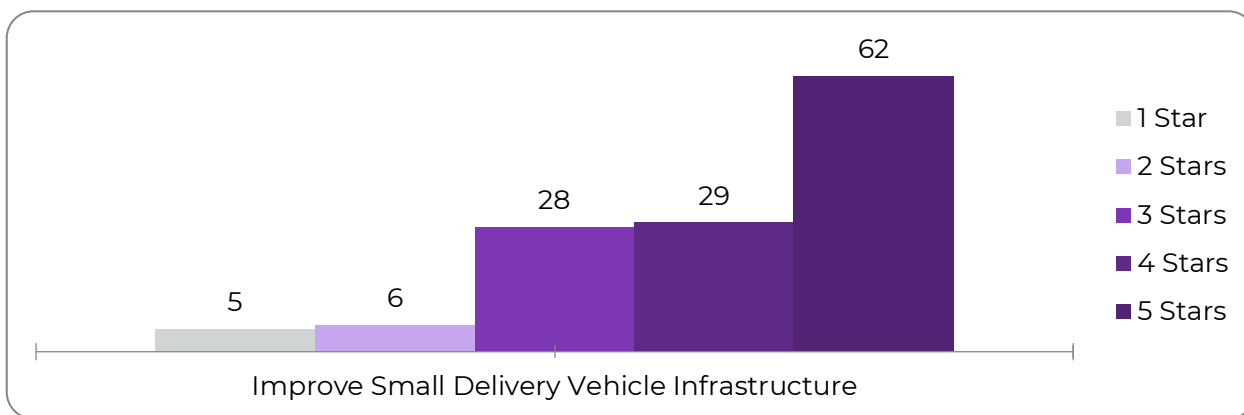
There was a total of 630 responses in the *Rerouting Truck Trips and Parking* category. The average response for the four potential solutions was 4.20, and the highest averages were for truck parking and fueling outside cities and truck to train cargo transfer areas.

Truck Parking & Fueling Outside Cities



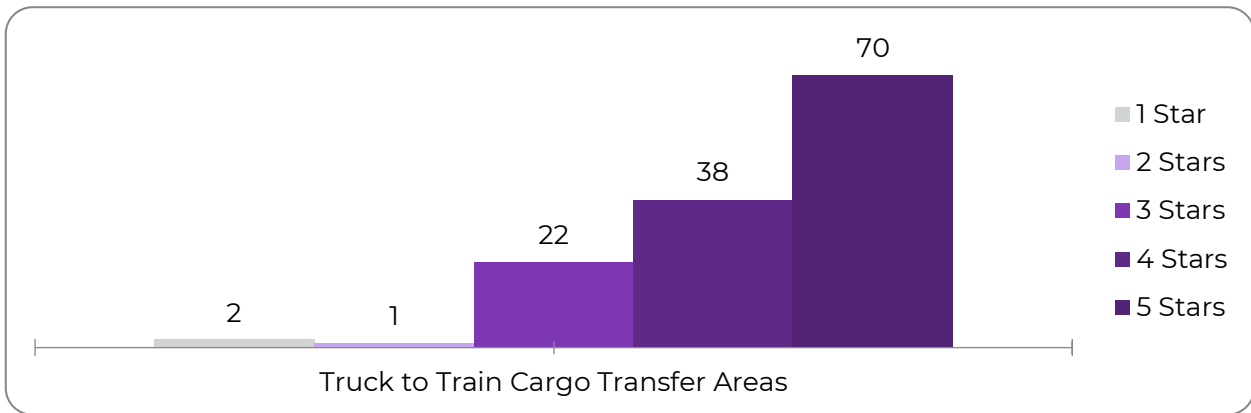
responses in the *Truck Parking & Fueling Outside Cities* strategy. The average response was 4.34, the highest average in this category. Roughly 56% of responses were those who strongly agree (5 stars) with *Truck Parking & Fueling Outside Cities* as a solution. 96% were neutral (3 stars) or above. Themes include adding fueling locations away from communities and near freeways.

Improve Small Delivery Vehicle Infrastructure



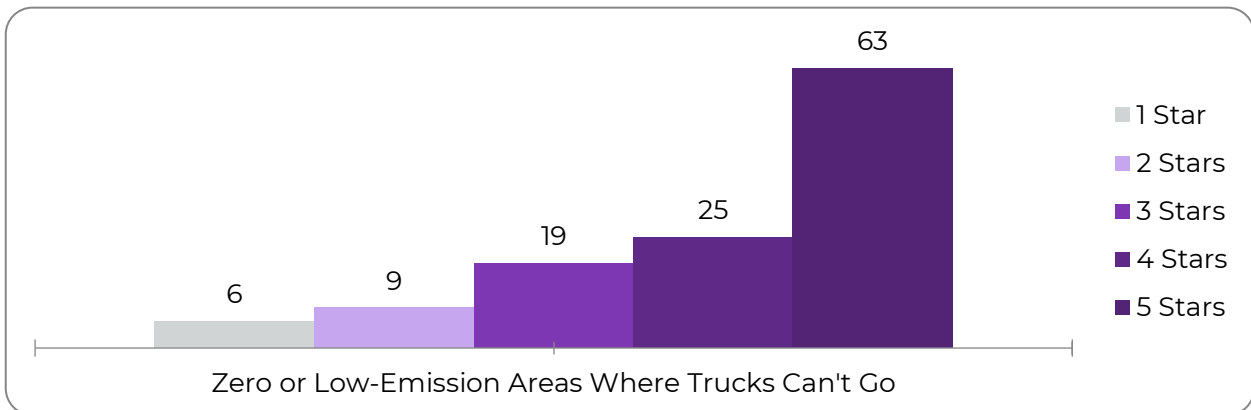
There was a total of 130 responses in the *Improve Small Delivery Vehicle Infrastructure* strategy. The average response was 4.05. Roughly 48% of responses were those who strongly agree (5 stars) with *Improve Small Delivery Vehicle Infrastructure* as a solution. 91% were neutral (3 stars) or above. Themes include positive reception for cargo bikes and potential locations near dense communities, but also concern they would create more congestion.

Truck to Train Cargo Transfer Areas



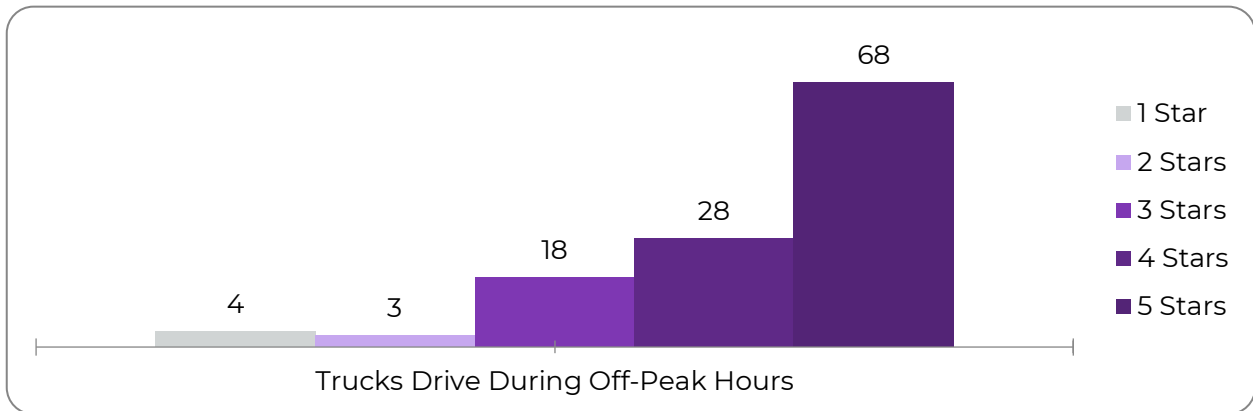
There was a total of 133 responses in the *Truck to Train Cargo Transfer Areas* strategy. The average response was 4.03. Roughly 52% of responses were those who strongly agree (5 stars) with *Truck to Train Cargo Transfer Areas* as a solution. 98% were neutral (3 stars) or above. Themes include placing transfer areas outside cities.

Zero or Low-Emission Areas Where Trucks Can't Go



There was a total of 140 responses in the *Zero or Low-Emissions Areas Where Trucks Can't Go* strategy. The average response was 4.04, the highest average in this category. Roughly 52% of responses were those who strongly agree (5 stars) *Zero or Low-Emission Areas Where Trucks Can't Go* as a solution. 89% were neutral (3 stars) or above. Themes include concerns about negative effects on truck routes, and support for low-emission zones.

Trucks Drive During Off-Peak Hours

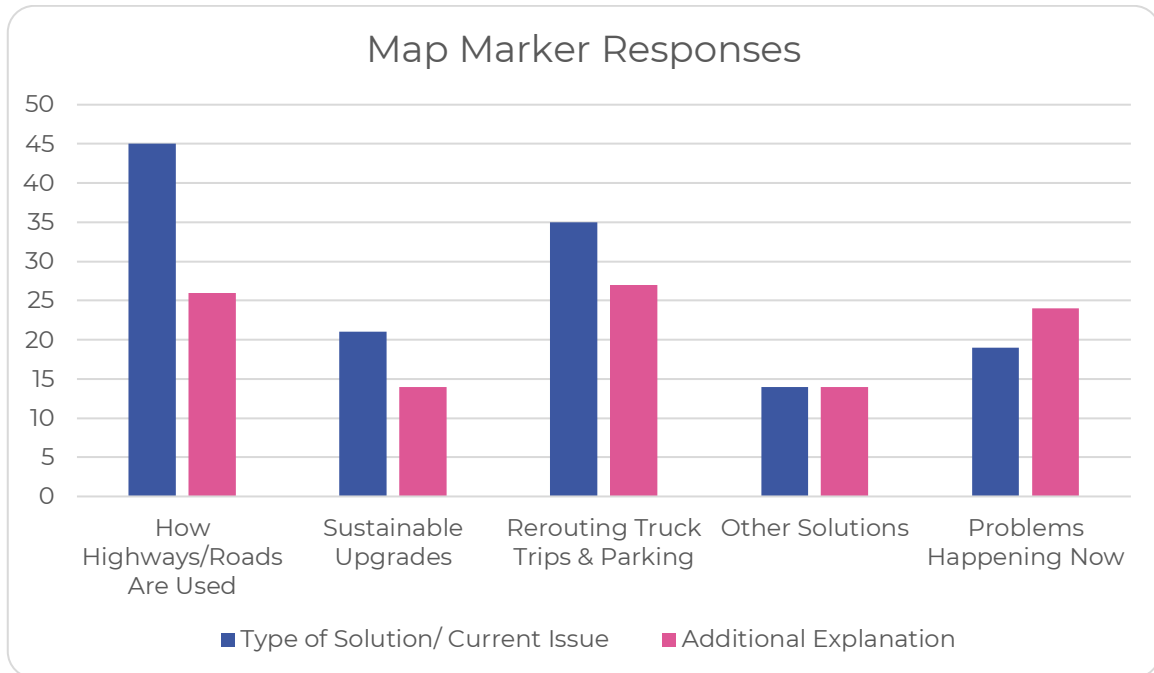


There was a total of 121 responses to the *Trucks Drive During Off-Peak Hours* strategy. The average response was 4.26. Roughly 56% of responses were those who strongly agree (5 stars) with *Trucks Drive During Off-Peak Hour* as a solution. 94% were neutral (3 stars) or above. Themes include support for this strategy but concerns about enforcement and backlash.

2.3 Map Markers

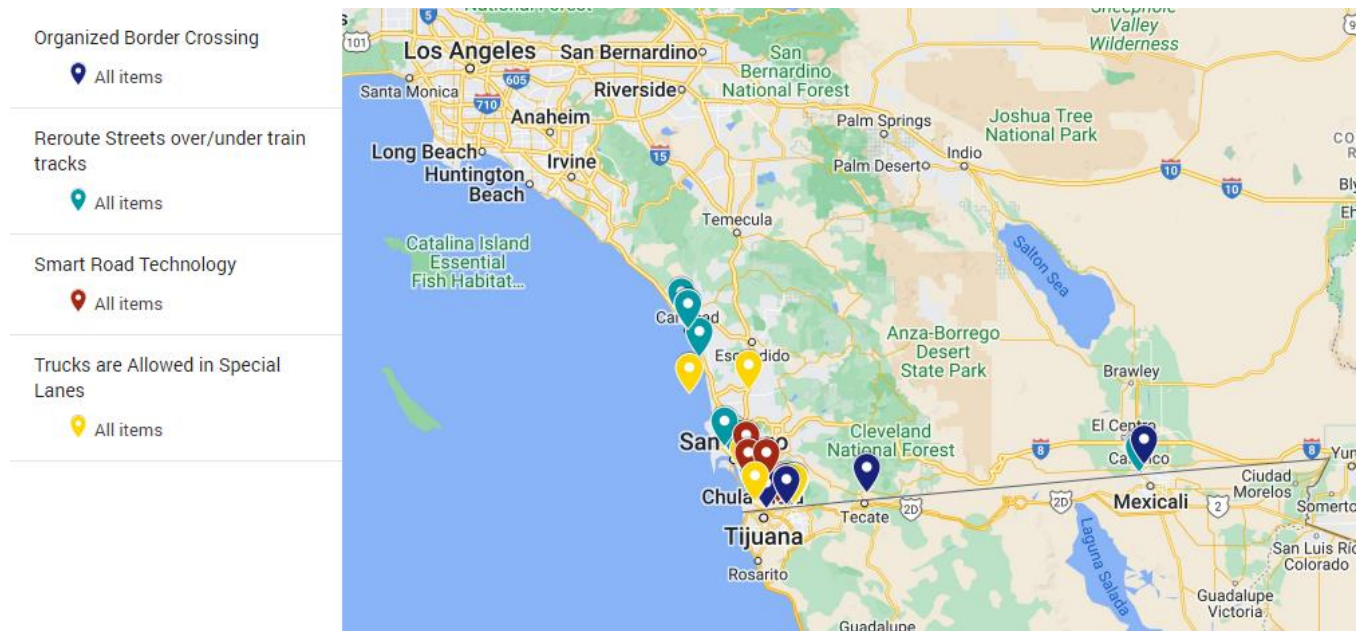
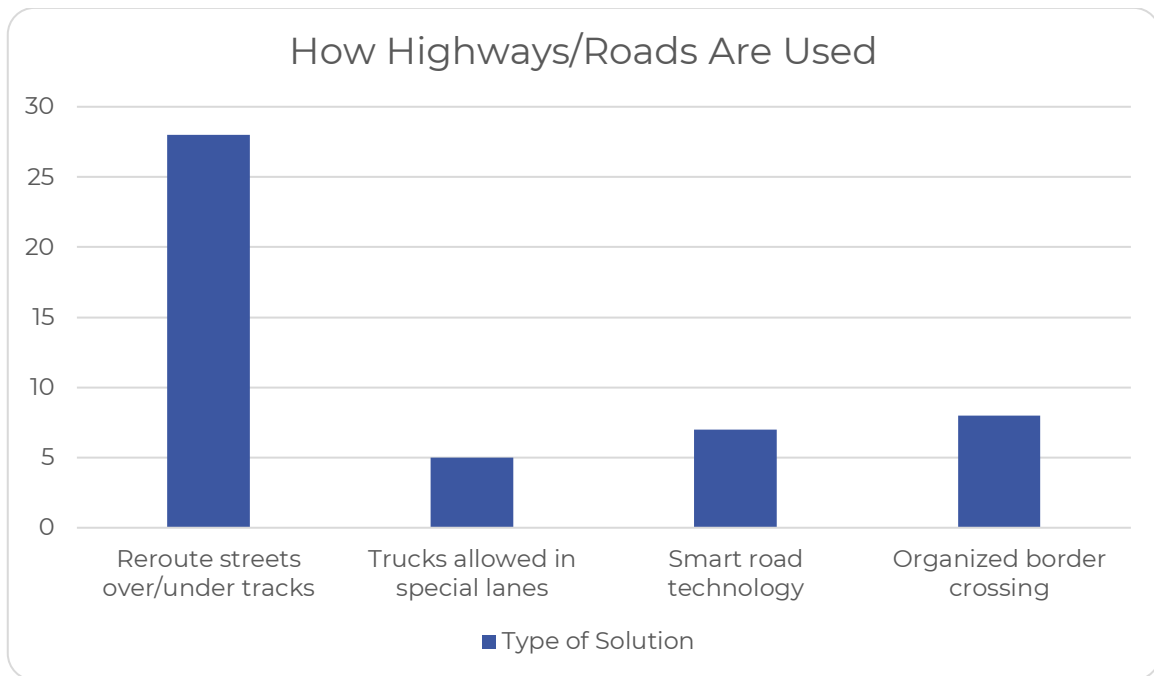
Screen 4 of the MetroQuest contained a map and asked participants to find challenges and potential solutions in specific locations within the study area. Participants were asked to drag and drop onto the map at least one marker from the categories listed below.

Question	Responses
Reimagine How Highways/Roads Are Used	48
Rerouting Truck Trips and Parking	39
Problems Happening Now	31
Sustainable Upgrades	23
Other Solutions	19



2.3.1 How Highways/Roads Are Used

There were 48 responses with solutions presented in this category. 5 responses were from participants in Imperial County, with the rest in San Diego County. Major themes included eliminating at-grade crossings, traffic delays resulting in poor efficiency for freight and emergency response, and the need for dedicated lanes.

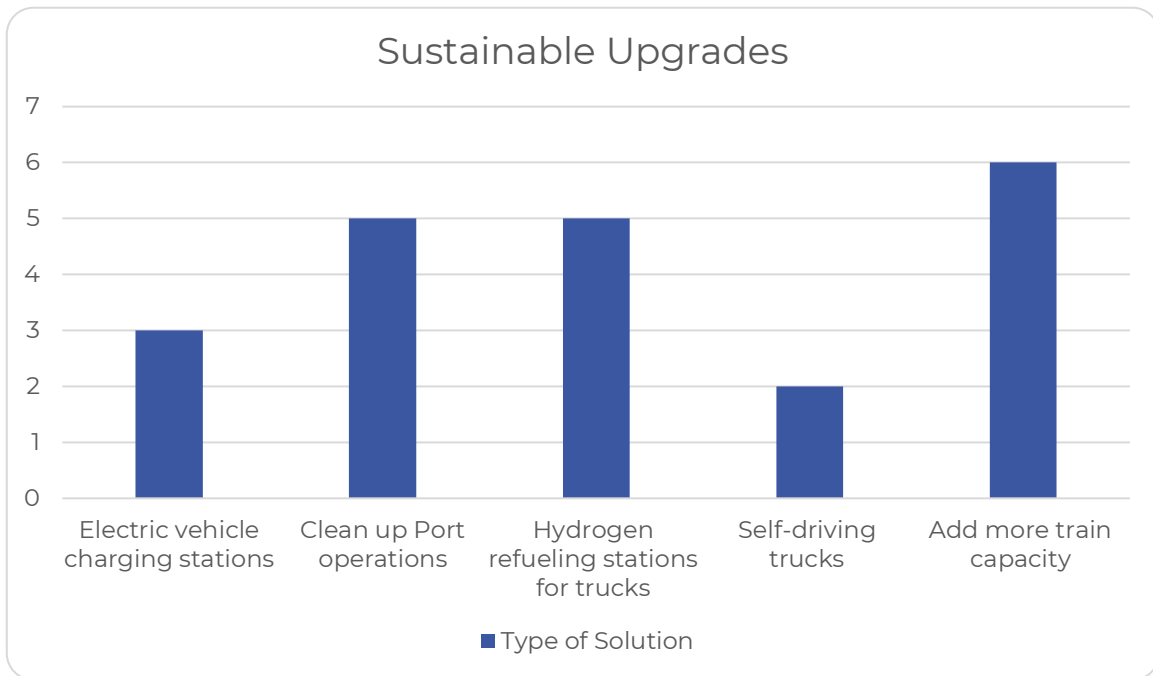


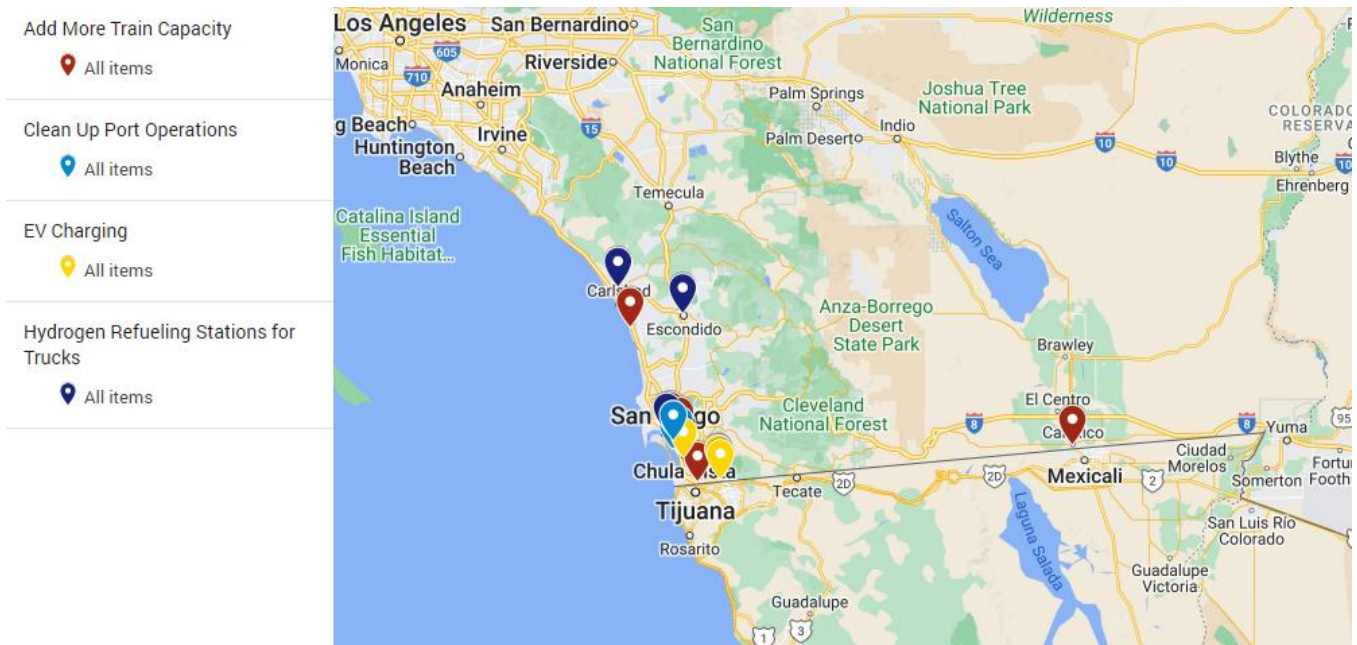
Feedback included:

- **Reroute Streets Over/Under Train Tracks** - Removing all at-grade crossings from Taylor through Downtown.
- **Organized Border Crossing** - Having a special border crossing dedicated for trucks off CA 11 to help further reduce wait times.
- **Reroute Streets Over/Under Train Tracks** - Major delays in idling fire safety response time issue. Vehicles stack for hours blocking east west connectivity of the city. This is an international border access point interrupted by the railroad (**Calexico Border Crossing**).
- **Smart Road Technology** - Border crossing technology for Otay Mesa area since high percentage of cargo trucks in this area.
- **Reroute Streets Over/Under Train Tracks** - SR-98 needs an overpass. This is one of two east west crossings in the city and a fire-safety issue as this backs up due to south border crossing. (**Calexico Border Crossing**).

2.3.2 Sustainable Upgrades

There were 23 responses with solutions presented in this category. 1 response was in Imperial County, with the rest in San Diego County. Major themes included double tracking rail infrastructure and recommending location for solutions.



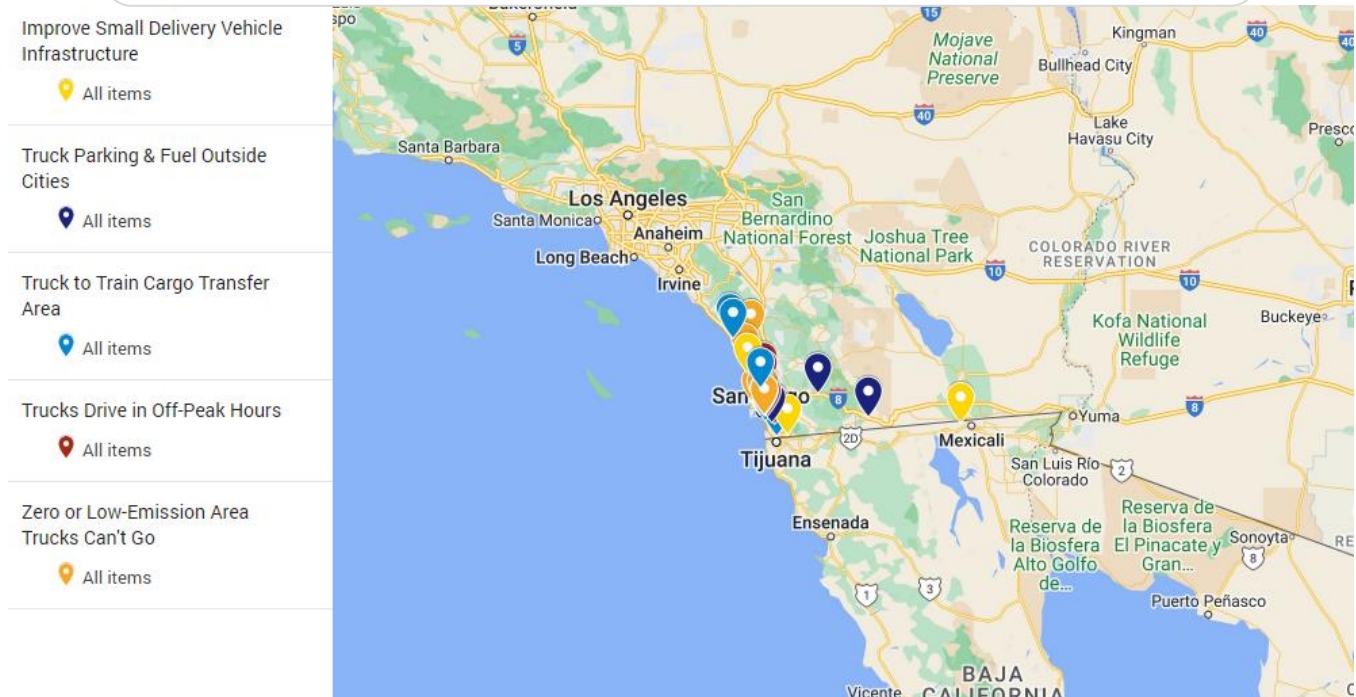
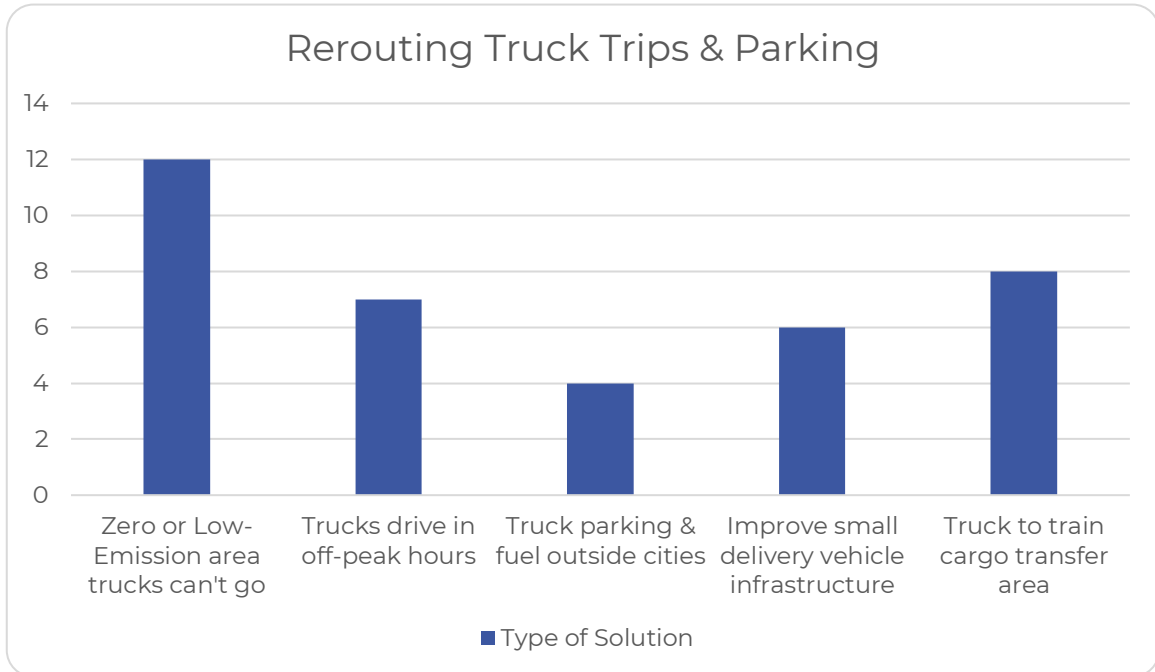


Feedback included:

- **Add More Train Capacity** - Improvements to rail corridor could increase freight rail traffic through Mexicali and reduce truck traffic.
- **Hydrogen Refueling Stations for Trucks** - Look at old Harbor Drive-in site along north side of SR-54 to provide overnight truck parking with electrical and hydrogen fueling stations. Amazon currently using this site for fleet parking.
- **Add More Train Capacity** - Add freight and long-distance Amtrak trains through San Diego & Arizona Eastern (SD&AE) Railway/ the San Diego and Imperial Valley Railroad (SD&IV)
- **Hydrogen Refueling Stations for Trucks** - Hydrogen refueling that could be collaborated with MTS if they decide to pursue hydrogen fueling (**854 Tenth Ave, San Diego, CA 92101**)
- **Add More Train Capacity** - Long stretch of single-track (**Leucadia, CA**)

2.3.3 Rerouting Truck Trips & Parking

There were 39 responses with solutions presented in this category.



Feedback included:

- **Truck to Train Cargo Transfer Area** - Old yard could function as a transfer point for Northern San Diego County. Near Santa Fe Ave. & Nautilus St., Del Mar, CA.
- **Zero or Low-Emission Area Trucks Can't Go** - Midway District is a high

pedestrian activity area with high concentrations of disadvantaged or displaced populations.

- **Truck Drive in Off-Peak Hours** - Mira Mesa Blvd. is congested with both cars and trucks. Suggests limiting when trucks can use Mira Mesa Blvd.
- **Trucks Drive in Off-Peak Hours** - I-805 corridor during peak hours should prohibit trucks and instead divert to SR-125 and to SR-54 to I-8 north to I-15 north. **(32.62933288, -117.05037)**
- **Improve Small Delivery Vehicle Infrastructure** - Cargo bikes for deliveries. This already works extremely well in Europe. **(32.71377946, -117.1574584)**

2.3.4 Other Solutions

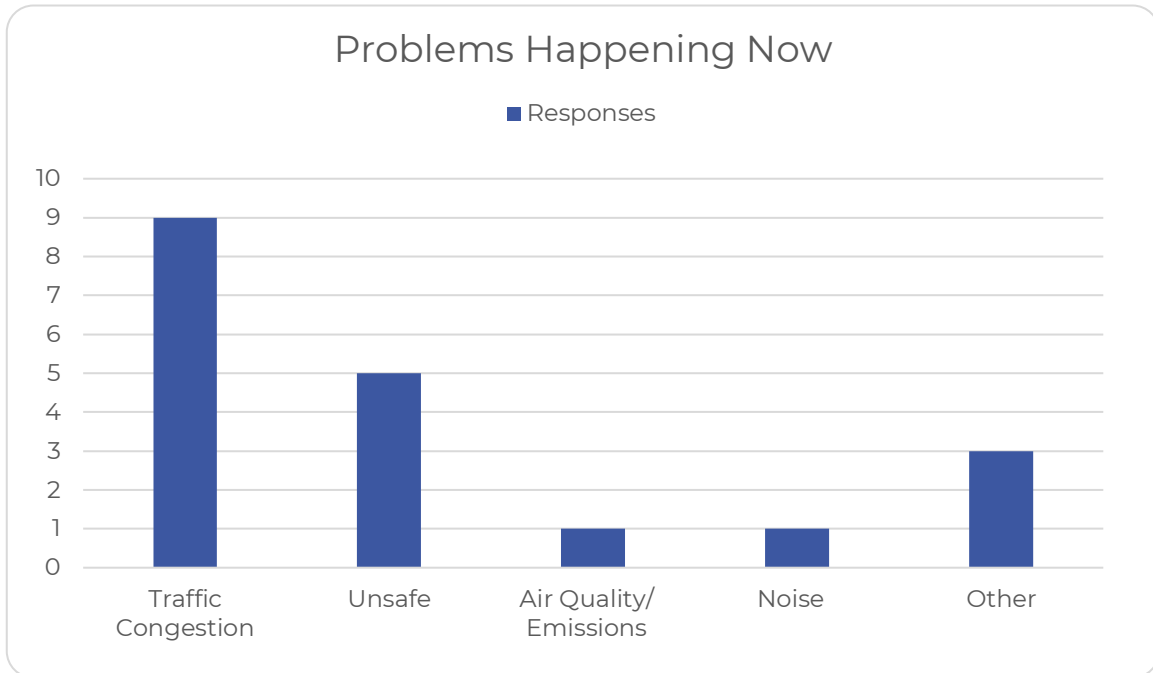
There were 19 responses with “Other Solutions” category.

Suggestions included:

- Charging / Zero-emission infrastructure (6 comments)
- Public transit expansion (5 comments)
- More road safety infrastructure (3 comments)
- SDA&E/SD&IV (3 comments)
- Border traffic (1 comment)
- El Chaparral crossing (1 comment)

2.3.5 Problems Happening Now

There were 31 responses with solutions presented in this category. 6 comments were in Imperial County, while the rest were in San Diego County. Responses were primarily related to traffic congestion, followed by safety issues.



Feedback included:

- **Traffic Congestion** - Significant amount of traffic. (**Near I-5 at Camino De La Plaza exit**)
- **Unsafe** - Cesar Chavez needs to go over 2nd street. grade separation desperately needed. This is a major international border crossing

controlled by a single signal light. (**Calexico Border Crossing**).

- **Unsafe** - Two lane Hwy 78, 111, 115 segments should be four lane or supply periodic passing lane segments to improve safety due to slow vehicles (incl trucks).
- **Unsafe** - Condition rating of rail bridge is nearing the poor category over San Luis Rey River.
- **Unsafe** - At-grade crossings in area has resulted in high number of pedestrian strikes. (**Near Carlsbad Village Station**)

2.4 Respondent Demographic Data

Demographic data was the last screen for respondents to answer. This part was 100% optional. Of the 162 responses associated with zip codes, 106, or 58%, were from the Barrio Logan/Logan Heights neighborhood.

Home Zip Code (94 respondents):

Zip Code	Number of Respondents	Zip Code	Number of Respondents
91910	3	92106	2
91915	1	92108	1
91942	1	92109	1
91945	2	92111	1
91950	5	92113	69
91977	2	92115	2
92008	1	92116	3
92054	3	92118	1
92092	1	92126	1
92101	2	92173	3
92102	6	92227	2
92103	1	92231	1
92105	2	92249	1

Job/School Zip Code (68 respondents):

Zip Code	Number of Respondents	Zip Code	Number of Respondents
91910	3	92108	1
91942	1	92109	1
91945	1	92111	2
91950	4	92113	37
91977	2	92115	2
92008	1	92116	1
92037	1	92123	1
92054	4	92126	1
92092	1	92154	1
92101	9	92173	2
92102	3	92243	4
92106	2		

Additional Comments:

- SANDAG has San Diego going in a better direction
- Invest in Southeast San Diego faster transit to reduce the number of vehicles on my

community that is between 4 major freeways

- We need better transit, more trains, cargo bikes, e-bike charging stations
- Expanding public transit is clearly the easiest most effective solution
- Work at City of Chula Vista Engineering Department.
- We need more streamlined truck routes in Imperial County.
- Barrio Logan deserves total support in our efforts to rid the area of big Riggs going around our community they park too long leaving their motors on - they should be prevented from delivering in our area, they take up residents' parking, we have parking permits for our public streets where we live, the drivers do not respect our resident's needs, some should use their alleys for deliveries not park in our areas, they park all day and overnight.
- daily.
- thank you, let's make America's Finest City a much better city
- Pacific Beach Middle School
- San Diego Global Vision Academy
- Stop polluting vulnerable communities and start investing in them. Don't do mileage tax.
- Thanks, considering our neighborhood and trying to resolve our issues. Thanks for hearing our voice.

3. APPENDIX: RAW DATA

3.1 Short Answer - Raw Data

Visit Time	Survey Language	Platform	Item	Answer
21-3-2023 20:57:29	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Mostly deliveries to residences. Sometimes they will park in a bike lane.
21-3-2023 20:58:01	English	mobile	What do you think might improve these problems?	More drop-off only parking spaces during business hours
21-3-2023 21:07:29	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	There is a lot of truck traffic on the freeways. It would be great to shift it to rail to minimize traffic. Trains do not impact us.
21-3-2023 21:07:44	English	mobile	What do you think might improve these problems?	Mode shift to rail to get trucks off the roads
21-3-2023 21:17:32	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Long freight trains will often impede traffic at at-grade crossings, regular package delivery often competes for curb space with parking and sometimes impedes traffic and transit when they have to stop in a through lane. This can also make pedestrians and cyclists unsafe by impeding sight lines. Freight on arterials will create more airborne pollutants as more multi family residential is built on these corridors.
21-3-2023 21:18:37	English	mobile	What do you think might improve these problems?	Removal of all at-grade crossings in the region. Addition of delivery drop off locations in dense neighborhoods. Dedicated curb space for delivery vehicles.
21-3-2023 21:40:29	Spanish	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Aunque el transporte de carga es muy importante, considero que puede generar contaminación acústica cuando se mezclan zonas industriales con zonas habitacionales y comerciales.

21-3-2023 21:41:37	Spanish	mobile	What do you think might improve these problems?	No considero necesario eliminar al transporte de carga de la ecuación sino que aumentar otros modos medios de transporte como los trenes de carga
22-3-2023 00:33:03	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Trucks are unsafe and incompatible with walking/biking/public transportation.
22-3-2023 00:34:24	English	mobile	What do you think might improve these problems?	More trains. Train service being national or government run
22-3-2023 01:04:50	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Wear and tear on roads, exhaust and traffic
22-3-2023 01:05:07	English	mobile	What do you think might improve these problems?	Unsure
22-3-2023 03:48:39	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Living between 5 major freeways in San Diego I am constantly surrounded by traffic, air pollution and lack of pedestrian access in order to prioritize vehicles.
22-3-2023 03:49:16	English	mobile	What do you think might improve these problems?	Add a transit system that takes over roads where cars are now. Reduce the length of lanes and increase bicycle and sidewalk access.
22-3-2023 04:30:16	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We live two blocks from the SAN airport FedEx terminal. We have constant trucks and torn up streets.
22-3-2023 05:50:56	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Driving next to semis makes me really anxious and I honestly just wish I didn't have to share the road with such large vehicles

22-3-2023 05:52:29	English	mobile	What do you think might improve these problems?	Would love to see all freight moved to trains from trucks. Might be idealistic, but it just seems safer, less polluting, less congestion on the highways. I know some semis need to be on the road but I've never even seen a freight train since I moved here, just makes me think there's reason to move freight onto railroads
22-3-2023 10:36:04	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Trucks are dangerously large and damage the roads. Not affected by trains.
22-3-2023 10:36:35	English	mobile	What do you think might improve these problems?	Please do far more to sanction trucks: who can drive them, the size, where they can go
22-3-2023 19:36:45	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Traffic congestion on Mira Mesa BLVD
22-3-2023 19:37:19	English	mobile	What do you think might improve these problems?	Having a separate route for trucks
23-3-2023 03:49:03	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Noise and traffic
23-3-2023 03:50:10	English	mobile	What do you think might improve these problems?	Electric trucks and freight vehicles, Updated trains
25-3-2023 04:51:29	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Trucks drive through constantly through our business and it is a small street where there are many people walking and visiting. The streets are small and they can barely make it through making it dangerous for pedestrians.
25-3-2023 04:52:26	English	mobile	What do you think might improve these problems?	Have them drive through a different route that is more reasonable. Not a residential neighborhood.

27-3-2023 20:15:14	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	The air quality
27-3-2023 20:15:30	English	mobile	What do you think might improve these problems?	Plant trees and plants
28-3-2023 00:10:23	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Not affected
28-3-2023 00:10:39	English	mobile	What do you think might improve these problems?	Build specific roads for those vehicles to use
28-3-2023 15:52:39	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Potholes, noise, garbage
28-3-2023 15:53:45	English	mobile	What do you think might improve these problems?	Better maintenance of roads, alternative routes, clean up efforts
28-3-2023 20:29:20	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They are a significant source of noise and air pollution. As well as damaging roadways.
28-3-2023 20:34:00	English	web	What do you think might improve these problems?	Switching to electric for short range truck hauling. Regular checks and maintenance for emissions. Speed limits and road material improvements. Native shrubbery and berms along freeways to reduce noise.
29-3-2023 16:50:32	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	by diesel particulate matter
29-3-2023 16:50:43	English	web	What do you think might improve these problems?	Transition from diesel to compressed natural gas, or electric/hydrogen for short routes.

4-4-2023 16:12:16	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Trucks more noticeable on the freeways. Not affected with train cargo.
4-4-2023 16:13:23	English	mobile	What do you think might improve these problems?	Can additional rail cargo service reduce truck cargo demand?
4-4-2023 16:38:18	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	There's a strong correlation
6-4-2023 21:39:41	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	pollution, noise, parking issues, and air quality
6-4-2023 21:39:55	English	web	What do you think might improve these problems?	zero emission vehicles!
6-4-2023 21:58:44	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	There are large volumes of trucks in my community because of cross border travel and amount of agriculture activities in my county.
6-4-2023 22:00:05	English	web	What do you think might improve these problems?	Investing more in our roads. Improving the roads to make them safer and adding passing lanes to major roads.
6-4-2023 23:46:07	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	La forma que afecta es por la contaminacion y el ruido, esto provoca diversas enfermedades en los residentes.
6-4-2023 23:47:38	Spanish	web	What do you think might improve these problems?	Entiendo que es dificil redirigir toda la circulacion pero quizas teniendo mas monitoreo del aire asi como filtros. Conforme al ruido implementar mas regulaciones.

7-4-2023 03:19:44	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Aside from noise pollution, all the exhaust is on the air we breathe on a daily basis. The trucks are also not supposed to drive through residential streets but many times they do. The weight of their cargo further breaks down the streets and contributes to the creation of potholes.
7-4-2023 03:21:09	English	mobile	What do you think might improve these problems?	The creation of transportation lanes in non-residential, commercial areas.
7-4-2023 13:18:01	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	on two lane roads driving behind slow moving heavy duty trucks can be challenging since they dont always keep up with traffic. on 4 lane highways, some trucks will pass another truck, further delaying passenger vehicle traffic in the faster lane which is frustrating
7-4-2023 13:22:39	English	web	What do you think might improve these problems?	on two lane rural type roads, intermittent passing lanes could help, minimizing trucking during peak commute times would also help within communities. Improving the freight moving system for better productivity in logistics around communities. Like intermodal bus/train/bike stations, similar concept for trucking where large trucks go in/out and smaller van type do deliveries in town; it would be more for larger truck/delivery
10-4-2023 15:54:27	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Worn down streets and roads. Delayed traffic.
10-4-2023 15:54:39	English	web	What do you think might improve these problems?	Maintaining streets.
10-4-2023 20:45:55	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	warehouses and distribution centers in Barrio Logan and national city bring so much heavy duty trucks to our neighborhood

11-4-2023 17:15:46	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	it is loud and sometimes gets dirty
11-4-2023 17:15:52	English	mobile	What do you think might improve these problems?	maybe have a schedule
11-4-2023 21:20:54	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We are affected by pollution
11-4-2023 21:21:35	English	mobile	What do you think might improve these problems?	better ecosystems and resources
11-4-2023 22:32:13	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	None
11-4-2023 22:32:28	English	mobile	What do you think might improve these problems?	I don't know
11-4-2023 22:33:02	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Im not affected
11-4-2023 22:33:07	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We're not affected by these.
11-4-2023 22:33:08	English	mobile	What do you think might improve these problems?	Im not affected
11-4-2023 22:33:27	English	mobile	What do you think might improve these problems?	There aren't any problems.
11-4-2023 22:33:54	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We are affected by have things move around that can't be moved by hand by people. By trains it affects the people that can't drive so it helps with having a ride to farther places.

11-4-2023 22:34:09	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Yes because lots of construction dad live near us
11-4-2023 22:34:16	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	N/A
11-4-2023 22:34:23	English	mobile	What do you think might improve these problems?	N/A
11-4-2023 22:34:57	English	mobile	What do you think might improve these problems?	I don't think anything because it's there just cars passing by
11-4-2023 22:35:54	English	mobile	What do you think might improve these problems?	I don't think there's a problem personally. But the problems can be pollution so like a lot of gas fumes that can affect us. I believe what can help is that not use the truck until they need them for emergencies.
11-4-2023 22:36:31	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We are not affected often
12-4-2023 19:46:23	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Trucks deliver and park in residential areas they idled their engines making horrible noise our air quality is very poor
12-4-2023 19:50:14	English	mobile	What do you think might improve these problems?	It is a priority among residents that scheley st be closed off because it invites heavy duty trucks from harbor drive to connect to Barrio Logan and destroy our st
12-4-2023 20:13:46	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	The trucks tend to take up parking or block streets, besides the noise, my house shakes each time a truck passes by, they dont even slow down for the dips.
12-4-2023 20:14:22	English	web	What do you think might improve these problems?	they take a different route and avoid going through residential areas

12-4-2023 21:31:27	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	It affects traffic and air contamination. I worry about my child's safety because the trucks pass by fast or they stop in middle of the street to unload. Safety is an issue especially when cars have to drive around the big trucks
12-4-2023 21:32:16	English	web	What do you think might improve these problems?	enforcing trucks to have a specific route out of the residential areas, they should drive by industrial roads not communities.
12-4-2023 22:41:52	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	hacen dano al ambiente por su ruidoso motor nuestro ambiente es contaminado la seguridad de la comunidad porque los conductores ignoran los letreros oficiales explicando por donde no deberian entrar
12-4-2023 22:44:42	Spanish	web	What do you think might improve these problems?	patrocinar el equipo para enforsar la seguridad de q ellos estan siguiendo el entrenamiento necesario
12-4-2023 23:59:52	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	pollution, take to much parking spots, danger for older people and kids, destruction of streets pavement causing more car repair maintenance, they increase automobile traffic,
13-4-2023 00:01:42	English	web	What do you think might improve these problems?	trucks should have and respect their own routes where they do less impact to our community
13-4-2023 00:11:38	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	el ambiente esta contaminado por los camiones de carga hacen dano al ambiente por sus motores
13-4-2023 00:12:26	Spanish	web	What do you think might improve these problems?	ellos ignoran los letreros de no manejar en ciertas calles
13-4-2023 00:19:50	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Mucha perdida de tiempo, destruccion de caminos, mucha polucion en la comunidad, no respetan las rutas de los trucks pesados
13-4-2023 00:20:28	Spanish	web	What do you think might improve these problems?	enforsarles sus propias rutas

13-4-2023 01:12:09	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Noise pollution and poor air quality
13-4-2023 01:12:39	English	mobile	What do you think might improve these problems?	Reducing the amount of trucks and time of hours
13-4-2023 17:52:46	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	w/some frustration - but we live in a commercial area(31st & webster)
13-4-2023 17:53:00	English	web	What do you think might improve these problems?	Mon- Frid 7AM -- 4PM
13-4-2023 18:01:00	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They pollute the air from their emissions and they park in the middle of the street causing traffic. I worry about my children's safety because they ride their skateboards to school, those big trucks dont slow down in resident areas.
13-4-2023 18:01:47	English	web	What do you think might improve these problems?	enforce violations with high penalties, if the company gets fine they will make sure that their drivers follow the rules.
13-4-2023 18:30:14	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	air quality is very poor, big trucks are causing a lot of pollution and cause road damage, the streets are horrible, there are many potholes.
13-4-2023 18:33:22	English	web	What do you think might improve these problems?	Have trucks reroute to different streets that doesnt pass through residential blocks. They should have designated areas for unloading goods.
13-4-2023 18:42:42	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Contaminan el aire por sus emisiones, afecta nuestra calidad de aire
13-4-2023 18:43:40	Spanish	web	What do you think might improve these problems?	limitar cuantos camiones pasan por la comunidad

13-4-2023 18:54:14	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They ignore posted signs to not drive along certain streets. They knowingly park in public spaces despite lack of parking for residents. They cause traffic when they park in the middle of the street
13-4-2023 18:55:05	English	web	What do you think might improve these problems?	Enforce traffic penalties and have a designated area for parking
13-4-2023 19:11:12	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They cause road damage, there is a lot of potholes and roads are in bad condition. Trucks are always driving fast, they make sharp turns in residential areas
13-4-2023 19:16:03	English	web	What do you think might improve these problems?	Reroute heavy-duty trucks to a more commercialize road and keep them off residential streets. Enforce speeding, safety is important
13-4-2023 19:29:15	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They ignore posted signs about speed limit and parking. There is hardly parking for residents, the road gets blocked when the trucks unload goods
13-4-2023 19:30:12	English	web	What do you think might improve these problems?	enforcing traffic penalties, the companies can afford them if not they should regulate drivers
13-4-2023 19:51:47	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They affect our air quality and drive too fast by parks and homes
13-4-2023 19:52:15	English	web	What do you think might improve these problems?	reduce the amount of trucks that commute the routes by communities.
13-4-2023 20:12:43	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	I noticed that sometimes they drive too fast, or dont slow down especially in the dip streets, you just hear a big bang
13-4-2023 20:13:14	English	web	What do you think might improve these problems?	reroute the trucks so they dont drive throught the residential areas

13-4-2023 20:19:35	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Provocan danos en la carreteas, y se estacionan en la calle onde se hace mas traffico
13-4-2023 20:20:08	Spanish	web	What do you think might improve these problems?	Redijir los camiones por otro lados
13-4-2023 22:02:13	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Very affected. Diesel trucks we're suppose to be rerouted a few years ago and it has not been upheld.
13-4-2023 23:35:51	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Air, noise and traffic pollution. All in conjunction, the horrific impact in our community continues to ravage our community.
13-4-2023 23:37:11	English	mobile	What do you think might improve these problems?	Make the industries who have created this decades old problem be accountable by action and fiscally.
13-4-2023 23:43:19	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	parking
13-4-2023 23:43:36	Spanish	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Pues mucho el disen que usan y el humo que sale de esos carros uno los respira y es dañino para la salud
13-4-2023 23:43:52	Spanish	web	What do you think might improve these problems?	carga menos contimnsasion
13-4-2023 23:44:06	Spanish	mobile	What do you think might improve these problems?	Pues usar otro tipo de carros o que estén más limpios los filtros
14-4-2023 00:12:41	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	causan muchos baches en las calles
14-4-2023 00:13:47	Spanish	web	What do you think might improve these problems?	Redijir las rutas en calles que no sean residencial.

14-4-2023 17:19:48	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	traffic delays thorough few city major boulevards or streets
14-4-2023 17:20:26	English	web	What do you think might improve these problems?	wider streets to handle trucks. more ways to traverse the cities. Overpasses at major intersections.
14-4-2023 19:28:58	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Heavy-duty trucks causes street damage like potholes and gravel lifted from road. My daily drive feels like im driving in a third world county with so many potholes, it is heavily trafficked with heavy duty trucks. The trucks park in middle of street to unload cargo/goods, it causes traffic to back up because residential streets are narrow therefor drivers have to take turns to get around. They also drive really fast, especially by Chicano park.
14-4-2023 19:40:23	English	web	What do you think might improve these problems?	Reroute trucks to go through a highway or away from residential homes, there should be a designated area for unloading like an alley, taking little parking that community has doesnt help either. Speed limit should be enforced with high penalties, company should encourage drivers to be cautious around parks and family homes. Rerouting and limiting the cargo they carry can help with air pollution and contamination.
14-4-2023 20:03:19	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They idle their engines making horrible noise, they pollute the air from their emissions considering our air quality very poor already. they knowingly park in our public spaces despite expensive parking tickets. Drivers ignore posted signs to not drive along certain streets.
14-4-2023 22:15:51	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Heavily affected.
16-4-2023 22:20:48	Spanish	mobile	What do you think might improve these problems?	Que prohibieran pasar por aquí los camiones de carga

16-4-2023 22:21:50	Spanish	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Bloqueo de las calles, y peligro para los peatones
17-4-2023 06:43:59	Spanish	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	el Ruido y el olor a Diesel
17-4-2023 06:45:21	Spanish	mobile	What do you think might improve these problems?	hacer una sola calle para camiones pesados
17-4-2023 15:42:26	English	web	What do you think might improve these problems?	If not possible to appoint another road, better and more frequent maintenance to the road.
17-4-2023 15:44:40	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Most of the main avenues and roads are heavily used by heavy duty trucks.
17-4-2023 16:21:39	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Heavy duty-trucks are highly polluting and the transition to zero emission trucks (specifically hydrogen trucks fueled by green hydrogen) needs to be prioritized.
17-4-2023 16:22:49	English	web	What do you think might improve these problems?	There should be the development of zero emission zones to limit heavy duty trucks going through neighborhood/community areas with low speeds.
17-4-2023 16:28:18	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Freight trains operate on the LOSSAN corridor in Oceanside. Given their length and the prevalence of at-grade crossings, they can be a barrier to community members and emergency services. There is also a lack of dedicated loading zones which can lead to unsafe conditions, such as delivery vehicles parking in pedestrian crossings.
17-4-2023 16:28:45	English	web	What do you think might improve these problems?	Dedicated loading zones and the removal of all at-grade rail crossings

18-4-2023 17:23:40	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	In National City, trucks hauling automobiles and other products to and from the Port District, park overnight and for longer periods of time, taking parking spaces from others in the neighborhood. Trucks idle for hours with no concern fro air quality or noise at night. Trucks speed through the city, as well.
18-4-2023 17:24:33	English	web	What do you think might improve these problems?	The Port District needs to build a freeway exit between 8th Street and Civic Center Drive for trucks to use off and on to I-5 and highway 15.
20-4-2023 02:58:07	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Exhaust pollution from heavy-duty trucks have caused
20-4-2023 14:56:47	English	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Alot. I live in Logan and there's always so many heavy duty/semi trucks on Main St. Aid pollution is bad especially from those types of cars
20-4-2023 14:57:27	English	mobile	What do you think might improve these problems?	Making them go through another route or having more cleaner trucks but that's on the company
20-4-2023 20:20:08	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We have to suffer through constant exposure to pollution. Kids cannot safely play in the streets because there are big rigs zooming down our streets. There is always noise pollution coming from the big trucks and cargo. The freight train closer to the port makes it difficult to get to the only bay front we have access to (crosby park).
20-4-2023 20:20:56	English	web	What do you think might improve these problems?	limiting the amount of trucks that can come into the neighborhood. Strongly enforce designated truck routes. Work with drivers to switch their vehicles to electric.
20-4-2023 20:33:00	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Street damage, potholes etc. environmental toxic, noise pollution

20-4-2023 20:34:35	English	web	What do you think might improve these problems?	Charge recovery fees, example: adopt a clean up area, help address homeless issues
20-4-2023 20:36:12	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Heavy duty trucks have caused so many problems in Barrio Logan. From spewing diesel particulates in the air and causing asthma to blocking streets and ally-ways. Heavy duty trucks are loud and the smell of smog from their engines are awful.
20-4-2023 20:39:38	English	web	What do you think might improve these problems?	We need to electrify trucks ASAP. We need more funding to help local businesses that use Heavy duty trucks and operate close to residences/parks/healthclinics and schools to transition to electric fleets. We also need to more strictly enforce our truck route to prevent port trucks from cutting through the community. I feel like roudabouts or lowered community signs/pedestrian bridges can create a barrier that would keep trucks from entering the community. Physical barriers can be good.
20-4-2023 20:49:34	English		How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Adds to traffic congestion and unsafe conditions for pedestrians and cyclists
20-4-2023 20:50:46	English		What do you think might improve these problems?	Not sure, dedicated truck routes/lanes.
20-4-2023 21:03:42	Spanish	mobile	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Por los contaminantes y congestionamiento vehicularque
20-4-2023 21:04:16	Spanish	mobile	What do you think might improve these problems?	Que los camiones sean zero emisiones y tengan rutas alternas
21-4-2023 17:42:59	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Trafico vehicular en las calles que estan muy reducidas para los carros grandes. Tambien el daño que hacen en las carreteras por el peso

21-4-2023 17:43:32	Spanish	web	What do you think might improve these problems?	Limitar el numero de calles en cuales pueden usar (areas residenciales)
21-4-2023 17:55:17	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Si, afecta mucho porque se hace mucho trafico y necesitamos agarrarnos tiempo para ir a nuestro trabajo y a cualquier casa que tenemos que hacer seria muy buena que se pueda mejorar
21-4-2023 18:00:05	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Principalmente demasiada contaminacion, mucho ruido con el cual afecta nuestro sueño y a la vez nos provoca estres
21-4-2023 18:00:52	Spanish	web	What do you think might improve these problems?	Que todos pongamos de nuestra parte, en lo que podamos para llegar a un acuerdo y haya soluciones
21-4-2023 18:02:37	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Mas trafico y peligro peatonal
21-4-2023 18:03:37	Spanish	web	What do you think might improve these problems?	Dejar entrar los camiones hasta un punto menos central
21-4-2023 18:21:33	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Causa de mucho trafico y peligro cuando las calles son mas angostas. El daño que hacen los camiones a las calles (baches)
21-4-2023 18:22:21	Spanish	web	What do you think might improve these problems?	Limitar cuando se pueden usar camiones grandes en calles de areas residenciales
21-4-2023 18:28:20	Spanish	web	What do you think might improve these problems?	Que tuvieran otras calles para ellos
21-4-2023 18:28:24	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Trafico vehicular
21-4-2023 19:49:43	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Trafico vehicular, contaminacion

21-4-2023 19:50:10	Spanish	web	What do you think might improve these problems?	Alejar y no transportar por estas areas
21-4-2023 19:54:33	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Hacen daño al ambiente por sus motores. El ambiente muy contaminado. Ignoran los letreros de no manejar en ciertas calles
21-4-2023 19:56:25	Spanish	web	What do you think might improve these problems?	El cambio necesario es enforzar violaciones con multas estrictas para los que violaron los letreros oficiales. Las companias del muelle deberia ser responsables por patrocinar entrenamiento oficial con los manejadores
21-4-2023 20:00:16	Spanish	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	El ambiente esta contaminado y mucho trafico
21-4-2023 20:00:59	Spanish	web	What do you think might improve these problems?	Patrocinar para enforzar y asegurar que ellos estan siguiendo
21-4-2023 20:46:13	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Health, Noise, pollution
21-4-2023 20:46:29	English	web	What do you think might improve these problems?	Regulate and enforce laws
21-4-2023 20:49:10	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Noise, Pollution
21-4-2023 20:49:16	English	web	What do you think might improve these problems?	Health Problems
21-4-2023 21:04:26	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Quality of Air is Horrible. Too much traffic

25-4-2023 19:07:30	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We are affected because the trash trucks come by and drop trash.
25-4-2023 19:07:41	English	web	What do you think might improve these problems?	Closing the lid and workers picking up the trash they drop.
25-4-2023 19:10:20	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Problems I see is all the pollution caused by trains, cars, trucks, also train horns are very loud. One last thing is trucks in the freeway threw back rocks causing to break cars windshields.
25-4-2023 19:10:33	English	web	What do you think might improve these problems?	Electric cars, trucks, boats (non-gas vehicles)
25-4-2023 19:19:09	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Well for starters I get stuck in traffic and I don't want to be in traffic.
25-4-2023 19:19:14	English	web	What do you think might improve these problems?	More car lanes.
25-4-2023 19:21:02	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Well for example there is a lot of work there. The hill I need to drive to is block by the work places.
25-4-2023 19:21:50	English	web	What do you think might improve these problems?	If we don't bother them from working on the streets and leave them alone
25-4-2023 19:27:37	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	In my neighborhood people are affected by the noise because most people that work early with heavy-duty machines make a lot of noise.
25-4-2023 19:27:48	English	web	What do you think might improve these problems?	People to not work until 10:00 AM
25-4-2023 19:34:53	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	No

25-4-2023 19:34:58	English	web	What do you think might improve these problems?	I don't know.
25-4-2023 19:44:29	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	People who tries to be cool with their car and smoke comes out.
25-4-2023 19:44:37	English	web	What do you think might improve these problems?	It could be bad for the air which can cause pollution.
25-4-2023 19:46:29	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	No I don't see it
25-4-2023 19:48:29	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	The gasoline burning
25-4-2023 19:48:37	English	web	What do you think might improve these problems?	No gas electric cars
25-4-2023 19:53:31	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	N/A. I'm not sure how trucks, trains & other cargos affect my community.
25-4-2023 19:53:34	English	web	What do you think might improve these problems?	I'm not sure
25-4-2023 19:57:48	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	In my neighborhood there is always construction going on in the streets and always causes traffic. There is always something with the roads concrete.
25-4-2023 19:58:00	English	web	What do you think might improve these problems?	Some construction projects to make the roads more clean and less bumpy/steep.
25-4-2023 19:59:36	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	I live in downtown so I hear noise from heavy-duty trucks all the time. i've gotten used to it so it doesn't bother me anymore

25-4-2023 19:59:47	English	web	What do you think might improve these problems?	Timing when they work so most amount of people are not bothered.
25-4-2023 20:46:09	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	I see these problems during traffic on the freeway.
25-4-2023 20:46:20	English	web	What do you think might improve these problems?	I think reducing the amount of trucks drive by an area.
25-4-2023 20:48:04	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Multiple people I know around this community suffer from asthma. Noise pollution is also a big thing especially being in an area near freeways
25-4-2023 20:52:30	English	web	What do you think might improve these problems?	Freeway caps, making sure the Port of San Diego stops putting polluting compounds in our neighborhoods.
25-4-2023 20:55:59	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	My neighbors and I are mainly affected by the noise it creates. I am not sure about the air pollution as I can't smell it.
25-4-2023 20:56:19	English	web	What do you think might improve these problems?	Either make a road in which the supplies can come through without disturbing anyone.
26-4-2023 15:16:15	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	I see a lot of pollution, there's a lot of noise as well. Air quality has affected the health of family members too.
26-4-2023 15:16:36	English	web	What do you think might improve these problems?	Navigating those trucks through certain routes or opening more jobs dedicated to cleaning. Possibly making the trucks run on green energy could help.
26-4-2023 15:18:57	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	N/A. Heavy-duty trucks have not really affected my community.
26-4-2023 15:19:03	English	web	What do you think might improve these problems?	N/A no problems

26-4-2023 15:24:10	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	I would have to say health problems as in air pollution or the noise of cars and trucks during the night. As well as the public transportation that is sometimes way to noisy in the night. I tend to see these problems around Barrio Logan.
26-4-2023 15:24:30	English	web	What do you think might improve these problems?	I think that people could try to be more considerate during the sleeping schedules. Besides that, everything seems fine.
26-4-2023 15:28:13	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Health problems is a big issue and our community often struggles with high asthma rates and high cancer rates. Noise pollution is also a very big problem. For me personally the loud sounds of trucks and trains is comforting because of how used to it I am. Traffic is a big issue for people and it can be very dangerous to walk around especially with young children.
26-4-2023 15:29:18	English	web	What do you think might improve these problems?	Incorporating routes that trucks can take that don't automatically go through homes and neighborhoods. Placing restrictions on the amount of noise companies can make too is also good. Making sure that we are holding these companies accountable is important.
26-4-2023 15:30:50	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	There can be bad air quality at times and noise due to the train station.
26-4-2023 15:31:00	English	web	What do you think might improve these problems?	Something that I think might improve these problems is having air purifiers.
26-4-2023 15:32:34	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	I think it is a problem because of safety problems.
26-4-2023 15:32:38	English	web	What do you think might improve these problems?	By using electric stuff

26-4-2023 15:33:44	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	bc we pollute
26-4-2023 15:33:45	English	web	What do you think might improve these problems?	eat it
26-4-2023 15:34:57	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	My neighborhood is good not much happening
26-4-2023 15:37:04	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	It's not really that bad honestly. We can sometimes hear the trucks that come to take the trash in the morning but it's not that bad. It kind of helps me wake up sometimes as well.
26-4-2023 15:37:46	English	web	What do you think might improve these problems?	For the people who do find the smell unlikeable and the beeping irritating, then I'd suggest a light system to let them know when they have reached the certain limit instead of beeping.
26-4-2023 15:39:25	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We can be affected by it because bad air can cause diseases and sicknesses to people. Traffic or even pollution can cause car accidents and injuries. This is why it's important to maintain a clean community or build better road projects to prevent traffic.
26-4-2023 15:39:35	English	web	What do you think might improve these problems?	Building new road projects and picking up after ourselves.
26-4-2023 17:25:01	English	web	What do you think might improve these problems?	Clean up where people from the community can volunteer
26-4-2023 17:26:04	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	I don't like pollution filled in our [incomprehensible]
26-4-2023 17:28:52	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being	I don't like pollution filled in our [incomprehensible]. And the noise from the factories at the port.

			transported through your community?	
26-4-2023 17:29:09	English	web	What do you think might improve these problems?	Well honest have a clean up where people from the community can volunteer.
26-4-2023 17:31:51	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	My neighborhood is affected in a positive way by trucks because the trucks bring food to the shops we buy food at. One thing that could be bad is pollution because the truck comes pretty often and the smoke and all the car also releasing smoke is bad for the environment.
26-4-2023 17:32:06	English	web	What do you think might improve these problems?	I don't think this problem could be fixed unless we get rid of cars.
26-4-2023 17:32:53	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	I feel the only way my community might be affected is by the noise and sometimes traffic.
26-4-2023 17:33:07	English	web	What do you think might improve these problems?	Quieter equipment and larger roads so people can go around.
26-4-2023 17:36:11	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	There is no heavy trucks, trains, or cargos around my neighborhood. The only trucks are for trash but it doesn't affect us.
26-4-2023 17:36:17	English	web	What do you think might improve these problems?	Nothing, because it's normal.
26-4-2023 17:40:06	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	No we are not affected by any of these except probably with bad air quality because of smoking.
26-4-2023 17:40:10	English	web	What do you think might improve these problems?	Drug control

26-4-2023 17:44:01	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We are not affected by heavy-duty trucks, trains, or other cargo being transported.
26-4-2023 17:44:19	English	web	What do you think might improve these problems?	I haven't experienced this problem so I don't really think I can speak on this matter.
26-4-2023 17:51:09	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We are not affected by this.
26-4-2023 17:51:19	English	web	What do you think might improve these problems?	I don't know because I haven't experienced this.
26-4-2023 17:53:51	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Me and my neighbors often hear garbage trucks and loud machines outside which is normal in every neighborhood but the thing is that they just happen only at night.
26-4-2023 17:54:25	English	web	What do you think might improve these problems?	Maybe setting time limits for these things and enforcing those laws.
26-4-2023 18:00:06	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They are just loud.
26-4-2023 18:00:19	English	web	What do you think might improve these problems?	Scheduled routines for moving cargo, etc.
26-4-2023 18:14:41	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They are loud and make a lot of pollution
26-4-2023 18:14:48	English	web	What do you think might improve these problems?	Electric trucks
26-4-2023 18:16:07	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They take up too much space.

26-4-2023 18:17:24	English	web	What do you think might improve these problems?	More [incomprehensible]
26-4-2023 18:20:10	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	We are affected by not being able to have extra parking spots for visitors while these trucks take up space/streets/sidewalks. And the noise that can make people scared and kids cry.
26-4-2023 18:20:32	English	web	What do you think might improve these problems?	Maybe only using those vehicles when necessary and while people are working to not be bothered.
26-4-2023 18:22:45	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Doesn't bother me
26-4-2023 18:22:46	English	web	What do you think might improve these problems?	Not sure
26-4-2023 18:24:35	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Never really, maybe some roadwork by Friars Rd. But that's about it.
26-4-2023 18:24:47	English	web	What do you think might improve these problems?	Creating more roads for other ways to go to other destinations.
26-4-2023 18:31:48	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Not affected at all
26-4-2023 18:35:40	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	The problem the world has is pollution. Sometimes people throw the food away, sometimes people leave lying on the ground affecting animals to die. The problem we have at home similar to wasting foods but different.
26-4-2023 18:36:06	English	web	What do you think might improve these problems?	How I can solve this problem is by saving anything I throw away, or using it for other people to help build something out of trash and turn it to hard solid wood.

26-4-2023 18:40:55	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They knowingly park in our public spaces despite expensive parking tickets that their companies can afford to pay. They ignore posted signs to not drive along certain streets.
26-4-2023 18:41:23	English	web	What do you think might improve these problems?	The highly needed change is to completely enforce violations and enact and apply enforcement high penalties to the companies/drivers that violate the public signage.
26-4-2023 18:42:59	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	They idle their engines making horrible noise. They pollute the air from their emissions. Our air quality is very poor
26-4-2023 18:43:18	English	web	What do you think might improve these problems?	Commit to a schedule for repairs to the affected streets. Fund the needed enforcement team to ensure that accountability prevails.
26-4-2023 18:46:01	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Late most mornings creating chaos. Horrible weather conditions.
26-4-2023 18:46:12	English	web	What do you think might improve these problems?	Having these huge pick up trucks transported through other areas.
26-4-2023 18:47:43	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Very dangerous for my children coming home from school. They don't follow rules
26-4-2023 18:47:52	English	web	What do you think might improve these problems?	Citations, towing regulations more severe
26-4-2023 18:49:32	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	The highly needed change is to completely "enforce violations" and enact and apply enforcement high penalties to the companies/drivers that violate the public signage.
26-4-2023 18:49:50	English	web	What do you think might improve these problems?	Waterfront companies must be held accountable and fund an official information and training process for all drivers

26-4-2023 18:51:59	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Safety is important because drivers ignore posted signs where they are not allowed to enter. Waterfront companies must be held accountable and fund an official information and training process for all drivers.
26-4-2023 18:52:15	English	web	What do you think might improve these problems?	Fund the needed enforcement team to ensure that accountability prevails. Commit to schedule.
26-4-2023 18:55:37	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Trucks deliver and park in residential areas. They idle their engines making horrible noise. They pollute the air from their emissions, our air quality is very poor. They knowingly park in our public spaces despite expensive parking tickets that their companies can afford to pay.
26-4-2023 18:56:19	English	web	What do you think might improve these problems?	The highly needed change is to completely enforce violations and enact and apply enforcement high penalties to the companies/drivers that violate the public signage. Waterfront companies must be held accountable and fund an official information and training process for all drivers.
26-4-2023 18:58:26	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Health issues. Traffic out of control
26-4-2023 18:58:35	English	web	What do you think might improve these problems?	Not so many trucks going through the Barrio
26-4-2023 18:59:47	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Noise all the time, truck idling, health issues, no parking
26-4-2023 19:00:50	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	No parking in front of our home. Health Issues. Noise all the time

26-4-2023 19:01:48	English	web	How are you and your neighbors affected by heavy-duty trucks, trains, and other cargo being transported through your community?	Health issues, noise problems, parking is terrible
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3.2 Strategy Ranking – Raw Data

Ranking Data

Set	Item	Rating	# Inputs
Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	1 Star	4
Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	2 Stars	14
Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	3 Stars	26
Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	4 Stars	27
Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	5 Stars	70
Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	1 Star	15
Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	2 Stars	14
Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	3 Stars	17
Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	4 Stars	26
Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	5 Stars	47
Reimagine How Highways/Roads Are Used	Smart Road Technology	1 Star	10
Reimagine How Highways/Roads Are Used	Smart Road Technology	2 Stars	18
Reimagine How Highways/Roads Are Used	Smart Road Technology	3 Stars	26
Reimagine How Highways/Roads Are Used	Smart Road Technology	4 Stars	30
Reimagine How Highways/Roads Are Used	Smart Road Technology	5 Stars	44
Reimagine How Highways/Roads Are Used	Organized border crossings	1 Star	3
Reimagine How Highways/Roads Are Used	Organized border crossings	2 Stars	8

Reimagine How Highways/Roads Are Used	Organized border crossings	3 Stars	29
Reimagine How Highways/Roads Are Used	Organized border crossings	4 Stars	41
Reimagine How Highways/Roads Are Used	Organized border crossings	5 Stars	59
Sustainable Upgrades	Electric Vehicle Charging Stations	1 Star	2
Sustainable Upgrades	Electric Vehicle Charging Stations	2 Stars	11
Sustainable Upgrades	Electric Vehicle Charging Stations	3 Stars	27
Sustainable Upgrades	Electric Vehicle Charging Stations	4 Stars	33
Sustainable Upgrades	Electric Vehicle Charging Stations	5 Stars	58
Sustainable Upgrades	Clean Up Port Operations	1 Star	4
Sustainable Upgrades	Clean Up Port Operations	2 Stars	4
Sustainable Upgrades	Clean Up Port Operations	3 Stars	11
Sustainable Upgrades	Clean Up Port Operations	4 Stars	22
Sustainable Upgrades	Clean Up Port Operations	5 Stars	101
Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	1 Star	4
Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	2 Stars	5
Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	3 Stars	32
Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	4 Stars	33
Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	5 Stars	47
Sustainable Upgrades	Self-driving Trucks	1 Star	36
Sustainable Upgrades	Self-driving Trucks	2 Stars	15
Sustainable Upgrades	Self-driving Trucks	3 Stars	29
Sustainable Upgrades	Self-driving Trucks	4 Stars	22
Sustainable Upgrades	Self-driving Trucks	5 Stars	23
Sustainable Upgrades	Add Train Capacity	1 Star	1
Sustainable Upgrades	Add Train Capacity	2 Stars	9
Sustainable Upgrades	Add Train Capacity	3 Stars	26
Sustainable Upgrades	Add Train Capacity	4 Stars	30
Sustainable Upgrades	Add Train Capacity	5 Stars	64
Rerouting Truck Trips and Parking	Truck Parking & Fueling Outside Cities	1 Star	1
Rerouting Truck Trips and Parking	Truck Parking & Fueling Outside Cities	2 Stars	4
Rerouting Truck Trips and Parking	Truck Parking & Fueling Outside Cities	3 Stars	17
Rerouting Truck Trips and Parking	Truck Parking & Fueling Outside Cities	4 Stars	32
Rerouting Truck Trips and Parking	Truck Parking & Fueling Outside Cities	5 Stars	70
Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	1 Star	5
Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	2 Stars	6
Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	3 Stars	28
Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	4 Stars	29
Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	5 Stars	62
Rerouting Truck Trips and Parking	Truck to Train Cargo Transfer Areas	1 Star	2
Rerouting Truck Trips and Parking	Truck to Train Cargo Transfer Areas	2 Stars	1

Rerouting Truck Trips and Parking	Truck to Train Cargo Transfer Areas	3 Stars	22
Rerouting Truck Trips and Parking	Truck to Train Cargo Transfer Areas	4 Stars	38
Rerouting Truck Trips and Parking	Truck to Train Cargo Transfer Areas	5 Stars	70
Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	1 Star	6
Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	2 Stars	9
Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	3 Stars	19
Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	4 Stars	25
Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	5 Stars	63
Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	1 Star	4
Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	2 Stars	3
Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	3 Stars	18
Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	4 Stars	28
Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	5 Stars	68

Comment Data

Visit Time	Survey Language	Platform	Set	Item	Comment
21-3-2023 20:59:35	English	mobile	Sustainable Upgrades	Self-driving Trucks	This technology is not yet sufficiently developed
21-3-2023 21:00:18	English	mobile	Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	Cargo bike deliveries would be great!
21-3-2023 21:19:47	English	mobile	Reimagine How Highways/Roads Are Used	Smart Road Technology	Transit must be included in any of these efforts
21-3-2023 21:42:52	Spanish	mobile	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	Siempre y cuando no se mezcle la circulación de vehículos particulares
22-3-2023 05:53:33	English	mobile	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	Please for the love of god don't add any more lanes but giving them shoulder access would be great

22-3-2023 05:54:50	English	mobile	Sustainable Upgrades	Electric Vehicle Charging Stations	Electric vehicles aren't even much better for the environment. Batteries alone are incredibly harmful
22-3-2023 05:57:30	English	mobile	Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	Would this create longer routes for trucks, thus generating more air pollution overall? Not necessarily a reason not to do it but should maybe be considered
22-3-2023 10:38:07	English	mobile	Sustainable Upgrades	Self-driving Trucks	This won't improve safety
22-3-2023 10:39:09	English	mobile	Sustainable Upgrades	Add Train Capacity	Unlike doing anything to the roads, this option is proven to reduce traffic because trains are far more efficient at hauling people and cargo
22-3-2023 10:40:04	English	mobile	Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	Great, but I get enforcement will be a challenge
22-3-2023 19:46:54	English	mobile	Sustainable Upgrades	Add Train Capacity	Work with the Baja California government to work on upgrading and modernizing the SDA&E/SD&IV railroad right of way from south of the border to southeastern SD County and through the Carrizo Gorge to Imperial County so we can have another rail route for frieght and passengers to ease congestionon the LOSSAN corridor.
22-3-2023 22:54:44	English	mobile	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	All lanes should be toll lanes to discourage driving personal vehicles
22-3-2023 22:56:12	English	mobile	Sustainable Upgrades	Self-driving Trucks	Self driving is still not viable. I self driving truck might hit a pedestrian or person on a bike
27-3-2023 20:22:47	English	mobile	Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	Not really a fan of robots
6-4-2023	English	web	Rerouting Truck Trips and Parking	Zero or Low-Emission	trucks should be able to go if zero emission

21:41:12				Areas Where Trucks Can't Go	
6-4-2023 21:41:35	English	web	Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	can be difficult on drivers
6-4-2023 23:52:24	Spanish	web	Reimagine How Highways/Roads Are Used	Smart Road Technology	No me ha tocado ver como funciona, pero igual puede ser una posible solucion.
6-4-2023 23:54:10	Spanish	web	Reimagine How Highways/Roads Are Used	Organized border crossings	Creo que lo importante es que realmente las agencias que se involucran en el cruce de fronteras esten consientes y lograr esa propuesta de tiempos.
7-4-2023 03:22:53	English	mobile	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	We don't have room to expand. Either build up or build below, but do not expand to the sides.
7-4-2023 03:26:53	English	mobile	Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	Hubs would create more traffic I think. Unless you build them outside the cities.
7-4-2023 03:28:37	English	mobile	Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	As long as they don't drive through residential areas and disturb people's sleep with noise pollution, it may be able to work.
7-4-2023 13:25:35	English	web	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	agree w/ concept of special lanes for trucks. In Imp Valley it would be more suitable for 2 lane rural hwys with limited passing lane segments as opposed to full lanes for miles compared to more urban areas
7-4-2023 13:31:01	English	web	Sustainable Upgrades	Electric Vehicle Charging Stations	if trucking will be needing these, yes. This may be expanded with private commercial truck stops which would augment public agency having to provide infrastructure; require it with new developments
7-4-2023 13:32:30	English	web	Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	if hydrogen trucking will be increased, yes and again, requiring private development truck stops to provide this type of infrastructure could augment public agency attempts to address
7-4-2023	English	web	Rerouting Truck Trips and Parking	Trucks Drive	this would have to be localized within specific communities and would be difficult to

13:36:29				During Off-Peak Hours	implement/enforce but yes during peak commuting times would reduce congestion
17-4-2023 16:08:36	English	web	Reimagine How Highways/Roads Are Used	Smart Road Technology	Signal priority should be more given to public transit vehicles
17-4-2023 16:10:45	English	web	Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	due to the inaccessibility of hydrogen fueling, there should be options for the hydrogen fueling to be open to the public as well. There should also be collaboration with local transit and government agencies that are also pursuing hydrogen to ensure that the hydrogen is green and make it more accessible for the region.
17-4-2023 16:11:53	English	web	Sustainable Upgrades	Self-driving Trucks	Due to how far away we are from this technology, I am skeptical about this, especially since truck-driving requires lots of focus and individual action to sudden events.
17-4-2023 16:12:39	English	web	Sustainable Upgrades	Clean Up Port Operations	This should be prioritized in areas of concentrated disadvantage (historically disadvantaged communities, marginalized community groups, low income neighborhoods, etc.)
17-4-2023 16:14:01	English	web	Sustainable Upgrades	Electric Vehicle Charging Stations	Due to the range restrictions on battery electric vehicles, I imagine much of the freight transition will be more focused on hydrogen fueling which should be a greater priority for the implementation strategy. However, where battery electric vehicles are used, it should be ensured that the electricity for charging is renewable energy sourced, and have sections that are open to the public as well.
17-4-2023 16:15:13	English	web	Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	This is my greatest priority for this section. It's critical to have zero or low-emission areas (example: England)
17-4-2023 16:33:06	English	web	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	The use of existing toll or carpool lanes would create a safety hazard due to speed differentials. Trucks would need their own special lanes.
17-4-2023 16:36:08	English	web	Reimagine How Highways/Roads Are Used	Smart Road Technology	Signal priority would be enormous beneficial on certain corridors. Efforts to expand signal priority to freight vehicles should be done in coordination with signal priority efforts for public transit.

17-4-2023 16:40:50	English	web	Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	Attention should also be paid to heavy rail corridors due to planned increases in intercity and regional rail service and long freight trains and their associated disruptions. Taylor Street should be included in any list of high priority crossings.
17-4-2023 16:45:35	English	web	Sustainable Upgrades	Add Train Capacity	LOSSAN is the most critical but additional train capacity on other rail corridors that support cargo should also be considered (i.e. Escondido Sub). Climate resilience & rail realignment efforts needs to be factored as well.
17-4-2023 16:47:29	English	web	Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	Work with transit agencies to build these hubs at existing transit centers in high density communities
17-4-2023 16:50:21	English	web	Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	This concept proved very successful during the 1984 LA Summer Olympics. Concept, however, would likely receive pushback from retailers due to the staffing challenges.
20-4-2023 14:58:59	English	mobile	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	definitely not expand carpool lanes but definitely legalize that semi trucks stay at the 2 most right because ive seen them in the fast or the 2nd closest to the left lane.
20-4-2023 15:00:29	English	mobile	Sustainable Upgrades	Clean Up Port Operations	also giving away proper air purifiers to those affected.
20-4-2023 15:01:30	English	mobile	Sustainable Upgrades	Self-driving Trucks	respectfully, this causes a lot of concern especially because trucks are much bigger and heavier and there not being a proper driver is even more terrifying than there being one.
20-4-2023 15:04:11	English	mobile	Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	personally i dont feel like usps/ups/dhl/etc delivery services create that much traffic. There usually fast/respect parking/find a way to do their deliveries without bothering. As for the pollution they contribute, im unsure but they dont drive a lot just stop a lot so many having them convert to electric cars when driving locally???? like Amazons new initiative on EVs
20-4-2023 15:05:53	English	mobile	Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where	this is tough because i dis say this in the previous portion but this is also going to make re routing hard in certain areas where there isnt enough places to re route trucks to.

				Trucks Can't Go	
20-4-2023 20:43:46	English	web	General Comment	General Comment	Hydrogen is not a solution we should be focusing on. Most hydrogen production is harmful to the planet and is produced using emission intensive processes. Electrification is the greenest solution to the climate change issue and poses the least amount of risk to community health.
20-4-2023 20:46:40	English	web	Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	San Diego's AB 617 communities deserve to be designates as Zero-Emission Zones! It's being done in places like Santa Monica CA already! https://www.santamonica.gov/press/2021/02/25/laci-launches-first-in-nation-zero-emissions-delivery-zone-with-city-of-santa-monica-and-partners-including-nissan-ikea
20-4-2023 20:49:41	English	web	Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	The fossil fuel industry is generating a ton of interest around hydrogen, presenting it as a solution to the climate crisis and conflating green hydrogen produced from renewables with hydrogen produced from fossil fuels. Currently, more than 99 percent of the United States's annual supply of hydrogen, about 10 million tons, comes almost entirely from fossil fuels through "steam methane reforming", an energy-intensive process in which methane gas is broken down into hydrogen and carbon dioxide.
20-4-2023 20:52:31	English		Sustainable Upgrades	Self-driving Trucks	Having driver assist is better, where if something happens to the driver or the driver is distracted, the truck's auto pilot will take over for the moment. It is not a good idea to rely on self driving alone....
20-4-2023 20:53:52	English		Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	This one while good on paper, in practice will hurt disadvantaged population areas if not careful
21-4-2023 18:29:06	Spanish	web	Sustainable Upgrades	Clean Up Port Operations	No se

21-4-2023 18:32:09	Spanish	web	Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	Cesar Chavez
21-4-2023 18:32:43	Spanish	web	Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	Cesar Chavez
25-4-2023 19:11:26	English	web	Sustainable Upgrades	Self-driving Trucks	Yes b/c truck drivers are getting tired of driving so much
25-4-2023 19:45:10	English	web	Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	I can't really understand this question
25-4-2023 19:54:17	English	web	Sustainable Upgrades	Clean Up Port Operations	I think things like these should be placed in places where there are a lot of people
25-4-2023 19:54:46	English	web	Sustainable Upgrades	Self-driving Trucks	I'm not sure, this can be dangerous. Trucks are heavy and there can be malfunctions.
25-4-2023 20:53:35	English	web	Rerouting Truck Trips and Parking	Truck Parking & Fueling Outside Cities	Somewhere where communities don't hurt
25-4-2023 20:53:47	English	web	Rerouting Truck Trips and Parking	Truck to Train Cargo Transfer Areas	Outside city
25-4-2023 20:54:00	English	web	Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	Anywhere in neighborhoods
26-4-2023 15:19:20	English	web	Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	N/A

26-4-2023 15:19:37	English	web	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	I think they should have their own lane, not carpool lane
26-4-2023 15:19:53	English	web	Reimagine How Highways/Roads Are Used	Smart Road Technology	I don't believe they should have special privileges
26-4-2023 15:20:04	English	web	Reimagine How Highways/Roads Are Used	Organized border crossings	Specific lane for them
26-4-2023 15:20:23	English	web	Sustainable Upgrades	Electric Vehicle Charging Stations	Maybe near freeways but not to where traffic is caused
26-4-2023 15:20:37	English	web	Sustainable Upgrades	Clean Up Port Operations	Near schools/or companies (gas)
26-4-2023 15:20:48	English	web	Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	N/A
26-4-2023 15:21:01	English	web	Sustainable Upgrades	Self-driving Trucks	Unsure about the self-driving portion
26-4-2023 15:21:20	English	web	Sustainable Upgrades	Add Train Capacity	More trains less pollution as many companies would be using trains
26-4-2023 15:21:34	English	web	Rerouting Truck Trips and Parking	Truck Parking & Fueling Outside Cities	Near freeways
26-4-2023 15:21:50	English	web	Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	mmm near convenient stores
26-4-2023 15:21:59	English	web	Rerouting Truck Trips and Parking	Truck to Train Cargo Transfer Areas	Near train stations

26-4-2023 15:22:11	English	web	Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	Very positive near gas stations
26-4-2023 15:22:22	English	web	Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	N/A
26-4-2023 15:29:34	English	web	Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	Near homes
26-4-2023 15:34:31	English	web	Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	ocean
26-4-2023 15:39:53	English	web	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	Yes it will be better
26-4-2023 17:37:03	English	web	Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	is somewhere w/ no houses
26-4-2023 17:37:11	English	web	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	the freeway
26-4-2023 17:37:21	English	web	Reimagine How Highways/Roads Are Used	Smart Road Technology	Somewhere in freeway
26-4-2023 17:38:29	English	web	Reimagine How Highways/Roads Are Used	Organized border crossings	Somewhere with flatplains
26-4-2023 17:38:48	English	web	Sustainable Upgrades	Electric Vehicle Charging Stations	parking spots
26-4-2023 17:55:20	English	web	Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	Don't know

26-4-2023 17:55:28	English	web	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	N/A
26-4-2023 17:55:39	English	web	Reimagine How Highways/Roads Are Used	Smart Road Technology	Don't yet understand
26-4-2023 17:56:06	English	web	Reimagine How Highways/Roads Are Used	Organized border crossings	Would not affect that much
26-4-2023 17:56:26	English	web	Sustainable Upgrades	Electric Vehicle Charging Stations	Gas stations
26-4-2023 17:56:34	English	web	Sustainable Upgrades	Clean Up Port Operations	Parks
26-4-2023 17:57:28	English	web	Sustainable Upgrades	Hydrogen Refueling Stations for Trucks	Gas stations
26-4-2023 17:57:42	English	web	Sustainable Upgrades	Self-driving Trucks	I would not trust a robot with a truck
26-4-2023 17:58:00	English	web	Sustainable Upgrades	Add Train Capacity	End of train
26-4-2023 17:58:14	English	web	Rerouting Truck Trips and Parking	Truck Parking & Fueling Outside Cities	Gas station-parks
26-4-2023 17:58:22	English	web	Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	N/A
26-4-2023 17:58:42	English	web	Rerouting Truck Trips and Parking	Truck to Train Cargo Transfer Areas	New unused (bought) area

26-4-2023 17:58:56	English	web	Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	Heavily affected cities
26-4-2023 17:59:07	English	web	Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	Everywhere
26-4-2023 18:17:41	English	web	Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	Trolley station
26-4-2023 18:17:48	English	web	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	Highway
26-4-2023 18:17:59	English	web	Reimagine How Highways/Roads Are Used	Smart Road Technology	Clairemont
26-4-2023 18:18:14	English	web	Reimagine How Highways/Roads Are Used	Organized border crossings	UTC
26-4-2023 18:18:25	English	web	Sustainable Upgrades	Electric Vehicle Charging Stations	Pacific Beach
26-4-2023 18:18:30	English	web	Sustainable Upgrades	Clean Up Port Operations	TJ
26-4-2023 18:25:43	English	web	Reimagine How Highways/Roads Are Used	Reroute Streets Over/Under Railroads	Not sure
26-4-2023 18:25:58	English	web	Reimagine How Highways/Roads Are Used	Trucks Allowed in Special Lanes	Freeway or right before
26-4-2023 18:27:32	English	web	Reimagine How Highways/Roads Are Used	Smart Road Technology	Traffic lights

26-4-2023 18:27:49	English	web	Sustainable Upgrades	Electric Vehicle Charging Stations	Don't have a space in mind
26-4-2023 18:28:02	English	web	Sustainable Upgrades	Clean Up Port Operations	Linda Vista
26-4-2023 18:28:29	English	web	Sustainable Upgrades	Self-driving Trucks	Don't agree could cause malfunctions
26-4-2023 18:28:52	English	web	Rerouting Truck Trips and Parking	Truck Parking & Fueling Outside Cities	By freeways
26-4-2023 18:29:06	English	web	Rerouting Truck Trips and Parking	Improve Small Delivery Vehicle Infrastructure	Save gas but more time
26-4-2023 18:29:46	English	web	Rerouting Truck Trips and Parking	Trucks Drive During Off-Peak Hours	Not sure don't really pay attention to that
26-4-2023 18:33:42	English	web	Rerouting Truck Trips and Parking	Zero or Low-Emission Areas Where Trucks Can't Go	I'm concerned over where the vehicles would pollute instead?

3.3 Map Markers - Raw Data

Visit Time	Marker	Latitude	Longitude	Answer1	Answer2
21-3-2023 21:02:36	Rerouting Truck Trips & Parking	32.71377945556 25	- 117.1574583578 02	Improve small delivery vehicle infrastructure	Cargo bikes for deliveries. This already works extremely well in Europe

21-3-2023 21:03:10	Other Solutions	32.7211464247197	- 117.166129378925	Lanes specifically for dropoffs during business hours, separate from bike lanes	Dangerous to go around on a bike
21-3-2023 21:10:37	Sustainable Upgrades	32.6958540218552	- 117.145566695053	Clean up Port operations	Diesel pollution
21-3-2023 21:23:02	How Highways/Roads Are Used	32.7296060692985	- 117.172710308302	Reroute streets over/under train tracks	Removal of all at-grade crossings from Taylor through Downtown
21-3-2023 21:24:04	Other Solutions	32.9274906220146	- 117.252209006205	Push for ZEV trains for freight and passenger rail too	
21-3-2023 21:45:20	How Highways/Roads Are Used	32.6475047545306	- 117.101424537646	Tecnología inteligente en las calles	
21-3-2023 22:36:52	Sustainable Upgrades	32.5539914145947	- 116.968244507243	Self-driving trucks	
22-3-2023 00:38:03	Problems Happening Now	32.5472019664696	- 116.944375854177		Too many idling trucks.
22-3-2023 00:38:24	Rerouting Truck Trips & Parking	32.7122760866492	- 117.165658489801	Improve small delivery vehicle infrastructure	Downtown needs size appropriate trucks that can deliver at all times while being safe to pedestrian.
22-3-2023 00:40:03	How Highways/Roads Are Used	33.2001850079415	- 117.376454023658	Reroute streets over/under train tracks	To many trucks on the road.
22-3-2023 00:40:10	How Highways/Roads Are Used	32.9497280135082	- 117.100651397383	Trucks allowed in special lanes	Lane already created.
22-3-2023 00:40:45	Sustainable Upgrades	32.7181477155045	- 117.13833866541	Add more train capacity	Trains are the most efficient form of transporting goods and services.

22-3-2023 01:09:21	How Highways/Roads Are Used	32.6611273275939	- 117.121647327888	Trucks allowed in special lanes	
22-3-2023 02:59:28	Other Solutions	32.8969260278751	- 116.881411426954		
22-3-2023 03:51:37	Other Solutions	32.7012285149115	- 117.106608885351	Fast transit	Because there is no fact east to west connection here
22-3-2023 03:51:42	Sustainable Upgrades	32.7001451115025	- 117.102403181616	Add more train capacity	
22-3-2023 03:51:46	How Highways/Roads Are Used	32.7001451115025	- 117.10426999909	Smart road technology	A lot of cars and not enough transit
22-3-2023 03:52:11	Problems Happening Now	32.7004340203642	- 117.107038038793		So much traffic on Ocean View Blvd and no fast transit, street lights, little to no pedestrian access, increase level of trash and no public services other than a park/rec center . The park is not being used to it's full potential due to lack of maintenance
22-3-2023 05:58:51	Problems Happening Now	32.7580479571092	- 117.173348799894		Just feel like i8 is where I see the most semis but I could be crazy for thinking that, I just drive there often
22-3-2023 10:42:08	Rerouting Truck Trips & Parking	32.9775079017612	- 117.26946011189	Improve small delivery vehicle infrastructure	Please no trucks on the 101
22-3-2023 19:54:34	Rerouting Truck Trips & Parking	32.9133292665387	- 117.142419824275	Trucks drive in off-peak hours	Mira Mesa BLVD is congested with both cars and trucks. By limiting to when trucks can use Mira Mesa BLVD, we can

					help improve traffic flow.
22-3-2023 19:57:10	Rerouting Truck Trips & Parking	32.6571791681248	-117.113891424278	Truck to train cargo transfer area	This area has the rail infrastructure but is instead being used as parking lots.
22-3-2023 19:58:37	How Highways/Roads Are Used	32.5451656287362	-117.030546045586	Organized border crossing	The border wait times are too long and by having it well organized and signed, we can reduce wait times
22-3-2023 20:00:06	How Highways/Roads Are Used	32.5581284566646	-116.910210107062	Organized border crossing	Have a special border crossing dedicated for trucks off of CA 11 to help further reduce wait times
22-3-2023 20:03:54	Other Solutions	32.5456403949672	-117.028993557339	Rebuild SDA&E/SD&IV with Baja California	It would help increase the amount of freight traffic by train to San Diego and it would help reduce rail traffic congestion along LOSSAN.
22-3-2023 20:05:27	Rerouting Truck Trips & Parking	32.549977276643	-117.034002346084	Truck to train cargo transfer area	By adding a truck to train area by the border, we can transfer cross border freight to trains
22-3-2023 20:08:26	Other Solutions	32.7527223255215	-116.198486986684	Rebuild Carrizo Gorge section of track, tunnels, and bridges for the SDA&E/SD&IV railroad	To ensure rail freight traffic can utilize the SDA&E/SD&IV corridor north of the border
22-3-2023 20:53:35	Sustainable Upgrades	32.5468540218838	-117.029865629073	Add more train capacity	Add freight and long distance Amtrak trains through SDA&E/SD&IV
22-3-2023 20:55:32	Rerouting Truck Trips & Parking	32.8782754595505	-117.165939053343	Truck to train cargo transfer area	Add infrastructure to move freight to/from Miramar industrial area and reduce truck traffic

22-3-2023 20:58:21	How Highways/Roads Are Used	32.5610752307556	-116.913237618309	Trucks allowed in special lanes	Makes border traffic easier
22-3-2023 20:58:57	Sustainable Upgrades	32.5697555710306	-116.944952057701	Electric vehicle charging stations	
22-3-2023 20:59:09	Sustainable Upgrades	32.5720701865811	-116.947140740257	Hydrogen refueling stations for trucks	
22-3-2023 20:59:46	Rerouting Truck Trips & Parking	33.2447190510823	-117.414389859728	Truck to train cargo transfer area	
22-3-2023 22:57:49	Other Solutions	32.6860658400368	-117.134513069652	Discourage driving, create incentives to use trains, transit, and cargo bikes	Cleaner air
23-3-2023 03:51:43	Rerouting Truck Trips & Parking	32.6934872976171	-117.167880686296	Zero or Low-Emission area trucks can't go	Get large vehicles out of downtown
23-3-2023 03:52:05	Sustainable Upgrades	32.8666773426196	-117.233798655046	Self-driving trucks	Self driving trucks will make far more efficient decisions than people and help clear traffic during rush hour
23-3-2023 03:53:16	Rerouting Truck Trips & Parking	32.7235310510075	-117.12874189235	Improve small delivery vehicle infrastructure	Get trucks out of high density areas
23-3-2023 03:53:20	Rerouting Truck Trips & Parking	32.8689842647136	-117.142474802507	Trucks drive in off-peak hours	Keep trucks off road during rush hour
23-3-2023 03:53:34	Other Solutions	32.8274504865632	-117.159640940202	Significantly expanded public transit	Basically all of these issues can be solved solely by making public transit more available and more frequent and more reliable. If public transit is more

					accessible and goes to more places more reliably, thousands of people will no longer have to drive, fixing the mass of issues with pollution, traffic, noise.
25-3-2023 04:54:04	Rerouting Truck Trips & Parking	32.6996601231207	-117.141771544816	Trucks drive in off-peak hours	Have them drive when there isn't People Out and about
27-3-2023 20:24:46	Sustainable Upgrades	32.6708972244663	-117.104748116172	Clean up Port operations	Air quality is horrible, and less trees everyday is making worse
27-3-2023 22:07:42	Rerouting Truck Trips & Parking	32.8834254867407	-116.747786895683		
28-3-2023 15:56:59	Problems Happening Now	32.67341612486	-117.112180827287		Trash potholes and pollution
28-3-2023 20:39:00	How Highways/Roads Are Used	32.5635522923169	-116.97962767794	Smart road technology	
28-3-2023 20:39:42	How Highways/Roads Are Used	32.559376042687	-117.050428831663	Reroute streets over/under train tracks	Traffic backs up onto the road when the trolley/train crosses.
28-3-2023 20:40:42	How Highways/Roads Are Used	32.5667225432161	-117.062363375502	Reroute streets over/under train tracks	For both pedestrian and vehicle safety this crossing should be improved to improve traffic flow and pedestrian crossing to park/trolley station.
28-3-2023 20:42:19	How Highways/Roads Are Used	32.5749311065334	-117.075431034591	Reroute streets over/under train tracks	
28-3-2023 20:42:41	How Highways/Roads Are Used	32.5837941134727	-117.083791234191	Reroute streets over/under train tracks	

28-3-2023 20:43:00	How Highways/Roads Are Used	32.6038852385975	-117.085389265748	Reroute streets over/under train tracks	
28-3-2023 20:43:19	How Highways/Roads Are Used	32.6154854472555	-117.089947900449	Reroute streets over/under train tracks	
28-3-2023 20:43:43	How Highways/Roads Are Used	32.6293501062095	-117.095267853374	Reroute streets over/under train tracks	
28-3-2023 20:44:07	How Highways/Roads Are Used	32.6362369046824	-117.098002325013	Reroute streets over/under train tracks	
28-3-2023 20:44:18	How Highways/Roads Are Used	32.6396547329945	-117.09928978534	Reroute streets over/under train tracks	
28-3-2023 20:45:45	How Highways/Roads Are Used	32.69844303984	-117.14719260973	Reroute streets over/under train tracks	
28-3-2023 20:46:16	How Highways/Roads Are Used	32.5668289942904	-117.072738604941	Smart road technology	
28-3-2023 20:46:43	How Highways/Roads Are Used	32.5676608432696	-117.074884372153	Trucks allowed in special lanes	
28-3-2023 20:47:01	How Highways/Roads Are Used	32.5512468802766	-116.939012699214	Organized border crossing	
28-3-2023 20:47:17	How Highways/Roads Are Used	32.5424512618016	-117.028259536165	Organized border crossing	
28-3-2023 20:47:40	How Highways/Roads Are Used	32.5449923381433	-117.029853512013	Reroute streets over/under train tracks	
28-3-2023	Problems Happening Now	32.5451491023317	-117.029385021389	Traffic Congestion	Significant traffic backs up here

20:49:06					
28-3-2023 20:49:10	Problems Happening Now	32.5459359323857	-117.031241110028	Traffic Congestion	Significant amount of traffic
28-3-2023 20:50:21	Problems Happening Now	32.5658919775449	-117.060990956227	Noise	In order for freight trains to be noticed and pass safely, they must run the horn at most crossings in the middle of the night.
28-3-2023 20:51:23	Other Solutions	32.5433798806512	-117.036440895203	Opening Chaparral crossing will reduce traffic on the other side of the freeway.	There is a significant amount of traffic dropping people off at the main border crossing.
28-3-2023 20:53:47	How Highways/Roads Are Used	32.5646826714675	-116.947688962241	Smart road technology	
28-3-2023 20:54:02	Sustainable Upgrades	32.5547719880274	-116.936874295493	Electric vehicle charging stations	
28-3-2023 20:55:10	Rerouting Truck Trips & Parking	32.5578104160894	-116.94605817916	Improve small delivery vehicle infrastructure	
28-3-2023 20:59:47	Rerouting Truck Trips & Parking	32.8402072243809	-116.698325987234	Truck parking & fuel outside cities	
28-3-2023 21:00:39	Rerouting Truck Trips & Parking	32.6780830254239	-116.290958114733	Truck parking & fuel outside cities	
4-4-2023 16:15:40	How Highways/Roads Are Used	32.5555972938714	-116.948101984552	Smart road technology	Border crossing technology for Otay Mesa area since high percentage of cargo trucks in this area.
4-4-2023 16:18:25	Problems Happening Now	32.6595865696557	-117.107111240474		Congestion on I-5 between I-15 and SR-54. Need widening and opportunity for commercial vehicle

					lanes due to National City Port.
4-4-2023 16:18:34	How Highways/Roads Are Used	32.6217370997582	-117.096490199806	Reroute streets over/under train tracks	Rail Grade separation needed in Chula Vista at E Street, F Street, H Street and Palomar Street due to Blue Line demand and cargo train service. Congestion at freeway interchanges and local streets due to railroad crossing gate down times.
4-4-2023 16:20:38	Sustainable Upgrades	32.6573749077218	-117.093264380276	Hydrogen refueling stations for trucks	Look at old Harbor Drive-in site along north side of SR-54 to provide overnight truck parking with electrical and hydrogen fueling stations. Amazon currently using this site for fleet parking.
4-4-2023 16:22:29	Rerouting Truck Trips & Parking	32.6293328841712	-117.050369961237	Trucks drive in off-peak hours	I-805 corridor during peak hours should prohibit trucks and instead divert to SR-125 and to SR-54 to I-8 north to I-15 north.
6-4-2023 21:42:02	How Highways/Roads Are Used	32.5552960608462	-116.945540801933	Organized border crossing	
6-4-2023 21:42:18	How Highways/Roads Are Used	32.5969567171557	-116.615950958183	Organized border crossing	
6-4-2023 21:42:24	How Highways/Roads Are Used	32.6940895986514	-115.478865997246	Organized border crossing	
6-4-2023 21:42:32	How Highways/Roads Are Used	32.7079571099306	-117.110335723808	Smart road technology	wireless charging tech for port operations

6-4-2023 22:27:43	Problems Happening Now	32.68629475452 19	- 115.3802662789 41		southbound truck congestion into Calexico East POE
6-4-2023 22:29:03	Other Solutions	32.66722231507 79	- 115.5001423030 59		Under utilized rail that could carry border freight goods.
6-4-2023 22:31:06	Problems Happening Now	32.67905139361 73	- 115.4942642645 45		trucks using SR-98 in this area of the City of Calexico are problematic due to the amount of schools located south of SR-98
6-4-2023 22:32:44	Problems Happening Now	33.12512790506 74	- 115.8544248879 77		Border Patrol Checkpoint causes major delays for passenger vehicles and trucks.
7-4-2023 03:30:03	How Highways/Roads Are Used	32.72049961988 86	- 117.1607794795 43	Reroute streets over/under train tracks	When the trains stop in downtown, the streets are blocked and traffic stops for about 20 -40 mins. I used to work in seaport, and wouldn't be able to get to my car parked on the other side and would have to wait in the cold until the train would move again. I had to climb over the train once to get to the other side. It was super dangerous but I couldn't wait any longer.
7-4-2023 13:37:44	Problems Happening Now	32.79111683342 62	- 115.2536462706 83	Unsafe	2 lane Hwy 78, 111, 115 segments either 4 lane (\$) or provide periodic passing lane segments to improve safety due to slow vehicles (incl trucks). Also improving the shoulder widths on

					Hwy 78 from Brawley to Palo Verde would help.
7-4-2023 13:41:11	Rerouting Truck Trips & Parking	32.6385979415369	-115.539290801933	Improve small delivery vehicle infrastructure	when crossing north to US large trucks that are hauling locally within the county should have this opportunity to go to a location outside cities and break loads down to smaller delivery vehicles to reduce the congestion within the cities of large trucking
10-4-2023 15:57:12	Problems Happening Now	32.6657699940872	-115.49809205051	Air Quality/Emissions	
10-4-2023 15:57:22	Problems Happening Now	32.6727061564851	-115.387541977069	Traffic Congestion	
11-4-2023 17:16:52	How Highways/Roads Are Used	32.6192280201677	-115.86670769228		
11-4-2023 17:16:53	Sustainable Upgrades	32.1181498201473	-116.465462575093		
11-4-2023 17:16:55	Rerouting Truck Trips & Parking	31.8759019836721	-115.350350270405		
11-4-2023 17:16:57	Other Solutions	32.6839788795168	-115.18555534853		
11-4-2023 22:36:03	Sustainable Upgrades	32.6285075918467	-117.088777725837	Electric vehicle charging stations	

11-4-2023 22:37:14	How Highways/Roads Are Used	32.5429818623744	- 117.031624273733		
11-4-2023 22:39:58	How Highways/Roads Are Used	32.9395946992752	- 117.344049564526	Trucks allowed in special lanes	This is because this area has a lot of traffic
12-4-2023 20:17:21	Rerouting Truck Trips & Parking	32.6984347462061	- 117.141799385145	Zero or Low-Emission area trucks can't go	Trucks make alot of noise and dont stop for dip
12-4-2023 21:27:33	Other Solutions	32.6938324254762	- 117.13589805434		Slow Truck
13-4-2023 00:05:19	How Highways/Roads Are Used	32.6478489320216	- 117.027938262871	Smart road technology	
13-4-2023 00:05:41	Rerouting Truck Trips & Parking	32.6940895281121	- 117.159774200371	Zero or Low-Emission area trucks can't go	less pollution in communities
13-4-2023 00:23:10	Rerouting Truck Trips & Parking	32.6848433235448	- 117.132308380058	Mejorar la infraestructura para vehículos de entrega pequeños	trques mas pequeños abra mas espacio y mas seguridad para la comunidad
13-4-2023 00:35:13	Problems Happening Now	32.6983705248542	- 117.141770898287		intersection with safety, many collisions and dip
13-4-2023 18:05:12	Rerouting Truck Trips & Parking	32.693862372982	- 117.131743562983	Trucks drive in off-peak hours	
13-4-2023 18:45:56	Problems Happening Now	32.6937833258063	- 117.133515659605		
13-4-2023 23:42:07	Sustainable Upgrades	32.6582255758359	- 117.132280713201	Clean up Port operations	

13-4-2023 23:42:34	Rerouting Truck Trips & Parking	32.65128822778 52	- 117.1240409671 07	Truck to train cargo transfer area	
13-4-2023 23:46:36	Problems Happening Now	32.69898819062 82	- 117.1466618995 88	Tráfico	
14-4-2023 00:10:17	Problems Happening Now	32.70504733061 21	- 117.1380113661 65	Otro (Describe)	hollos
14-4-2023 00:10:42	Problems Happening Now	32.70508014222 47	- 117.1438974615 47		hollos, carros se danans
14-4-2023 17:28:06	How Highways/Roads Are Used	32.66674357948 59	- 115.5011004758 91	Reroute streets over/under train tracks	cesar chaves needs to go over 2nd street. grade separation desperately needed. This is a major international border crossing controlled by a single signal light. Completely blocks traffic circulation north-south and east- west to the point of traffic control personnel routinely required to control traffic movements.
14-4-2023 17:29:56	Problems Happening Now	32.66670215966 91	- 115.5008858991 69	Unsafe	cesar chaves needs to go over 2nd street. grade separation desperately needed. This is a major international border crossing controlled by a single signal light. Completely blocks traffic circulation north-south and east- west to the point of traffic control personnel routinely required to control traffic movements.

14-4-2023 17:30:13	Problems Happening Now	32.6666795801708	- 115.500698144538	Traffic Congestion	
14-4-2023 17:33:04	How Highways/Roads Are Used	32.6790322264242	- 115.505088390563	Reroute streets over/under train tracks	SR-98 needs an overpass. This is one of two east west crossings in the city and a fire-safety issue as this backs up due to south border crossing.
14-4-2023 17:33:05	Problems Happening Now	32.6790305510238	- 115.505361347753	Traffic Congestion	
14-4-2023 17:33:11	How Highways/Roads Are Used	32.6740123399673	- 115.503065018719	Reroute streets over/under train tracks	This is one of two major crossings east west. Major fire safety response time issue and major idling point for residents and international travel.
14-4-2023 17:33:13	Problems Happening Now	32.6739544212174	- 115.503331954535	Traffic Congestion	
14-4-2023 17:33:20	How Highways/Roads Are Used	32.6666765726691	- 115.499709750516	Reroute streets over/under train tracks	Major border issue. Major delays in idling fire safety response time issue. Vehicles stack for hours blocking east west connectivity of the city. This is an international border access point interrupted by the railroad.
14-4-2023 17:33:22	Problems Happening Now	32.6667355983609	- 115.499806310041	Traffic Congestion	

14-4-2023 17:34:02	Problems Happening Now	32.6790135994048	- 115.500724334877	Traffic Congestion	South bound international traffic blocks city circulation to a standstill. Transition from SB SR-111, to WB SR-98 requires unsafe weaving, complicated by R.R. along SR-98. SB international traffic needs a better route to reduce idling of SB traffic as well as local traffic due to blocked access ways.
14-4-2023 19:41:31	Other Solutions	32.6983318938215	- 117.141739781117	Adding Stop Signs	Reduce impact of heavy duty trucks hitting the dip and cause houses to shake.
14-4-2023 19:44:17	Rerouting Truck Trips & Parking	32.6993121081444	- 117.143131688555	Zero or Low-Emission area trucks can't go	
14-4-2023 19:44:35	Rerouting Truck Trips & Parking	32.6937411452917	- 117.132070749139	Trucks drive in off-peak hours	
14-4-2023 19:44:46	Problems Happening Now	32.6958719790403	- 117.13370153222	Traffic Congestion	
14-4-2023 19:45:24	Rerouting Truck Trips & Parking	32.6836878490433	- 117.112846285649	Trucks drive in off-peak hours	
14-4-2023 19:45:53	Other Solutions	32.6959857166439	- 117.116743166509		
17-4-2023 16:23:47	Sustainable Upgrades	32.6877328653318	- 117.129561798027	Clean up Port operations	highly congested area that leads to lots of pollution in a low income area with marginalized populations

17-4-2023 16:23:59	Sustainable Upgrades	32.7143122618693	-117.155654327324	Hydrogen refueling stations for trucks	Hydrogen refueling that could be collaborated with MTS if they decide to pursue hydrogen fueling
17-4-2023 16:24:28	Sustainable Upgrades	33.2119546632144	-117.354340506079	Hydrogen refueling stations for trucks	Hydrogen refueling that could be done in collaboration with NCTD
17-4-2023 16:25:13	Sustainable Upgrades	33.1223176993623	-117.091498622878	Hydrogen refueling stations for trucks	Hydrogen refueling that could be done in collaboration with NCTD
17-4-2023 16:26:00	Rerouting Truck Trips & Parking	33.1555804700193	-117.341731782376	Zero or Low-Emission area trucks can't go	High pedestrian activity
17-4-2023 16:26:13	Rerouting Truck Trips & Parking	33.1940870802111	-117.373660798489		High pedestrian activity
17-4-2023 16:26:41	Rerouting Truck Trips & Parking	33.2015130410735	-117.244314285997	Zero or Low-Emission area trucks can't go	High pedestrian activity
17-4-2023 16:26:51	Rerouting Truck Trips & Parking	33.0427139421177	-117.293985916717	Zero or Low-Emission area trucks can't go	High pedestrian activity
17-4-2023 16:27:11	Rerouting Truck Trips & Parking	32.7533369348769	-117.206562361908	Zero or Low-Emission area trucks can't go	High pedestrian activity with high concentrations of disadvantaged or displaced populations
17-4-2023 16:27:39	Rerouting Truck Trips & Parking	32.7492569498841	-117.13028068294	Zero or Low-Emission area trucks can't go	High pedestrian activity
17-4-2023 16:27:50	Rerouting Truck Trips & Parking	32.7483658621906	-117.16461295833	Zero or Low-Emission area trucks can't go	High pedestrian activity
17-4-2023 16:28:26	Rerouting Truck Trips & Parking	32.6942774558301	-117.135940849336	Zero or Low-Emission area trucks can't go	Historically disadvantaged with high pedestrian activity and

					historically lots of freight pollution
17-4-2023 16:52:50	How Highways/Roads Are Used	32.7555953478492	-117.199925163007	Reroute streets over/under train tracks	Very busy intersection that see two trolley lines, COASTER service, Amtrak service, and freight trains pass through.
17-4-2023 16:56:23	Rerouting Truck Trips & Parking	32.8771979852518	-117.167454473875	Truck to train cargo transfer area	Central location with existing rail spurs in an area that is zoned for industrial & commercial uses.
17-4-2023 16:57:27	Sustainable Upgrades	32.635930330073	-117.100491692821	Add more train capacity	Reactivate rail line here for freight and passenger traffic
17-4-2023 16:58:06	Rerouting Truck Trips & Parking	32.6553433750209	-117.11313000278		Well-positioned as a cargo transfer location for the southern portions of the County. Existing rail spurs and complimentary land uses.
17-4-2023 17:00:44	Problems Happening Now	32.5609765620377	-116.970234409272	Other (Describe)	The lack of dedicated rest areas results in trucks parking on streets in the Otay Mesa area.
17-4-2023 17:01:48	How Highways/Roads Are Used	32.6291387209539	-117.095126224312	Reroute streets over/under train tracks	Intersection of a busy rail and busy road corridor
17-4-2023 17:02:00	How Highways/Roads Are Used	32.6394516416469	-117.09924693766	Reroute streets over/under train tracks	Intersection of a busy rail and busy road corridor
17-4-2023 17:03:05	Sustainable Upgrades	33.0751707061137	-117.305420078383	Add more train capacity	Long stretch of single-track
17-4-2023 17:03:26	How Highways/Roads Are Used	33.0643278378104	-117.301893882904	Reroute streets over/under train tracks	Congested rail-road crossing. Any double-tracking in Leucadia would necessitate the

					removal of the existing at-grade crossing here.
17-4-2023 17:06:38	Problems Happening Now	33.2035597848501	-117.388043206775	Unsafe	Condition rating of bridge is nearing the poor category
17-4-2023 17:08:01	Problems Happening Now	32.9728686925203	-117.266786560487	Unsafe	Condition rating of bridge is nearing the poor category
17-4-2023 17:09:36	Rerouting Truck Trips & Parking	33.2124344474852	-117.389947940851	Truck to train cargo transfer area	Old yard could function as a transfer point for Northern San Diego County
17-4-2023 17:11:55	Problems Happening Now	33.1596557531897	-117.349766428787	Unsafe	At-grade crossings in area has resulted in high number of pedestrian strikes
17-4-2023 17:12:02	How Highways/Roads Are Used	33.1602215947809	-117.35035651477	Reroute streets over/under train tracks	Busy intersections and issues with pedestrian strikes
17-4-2023 17:12:39	How Highways/Roads Are Used	33.1591797248963	-117.349337275345	Reroute streets over/under train tracks	Busy intersections and issues with pedestrian strikes
17-4-2023 17:24:40	How Highways/Roads Are Used	32.6038658111943	-117.085275086317	Reroute streets over/under train tracks	Intersection of a busy rail and busy road corridor
17-4-2023 17:24:46	How Highways/Roads Are Used	32.5838219794774	-117.083789631604		Busy intersection
17-4-2023 17:29:03	Sustainable Upgrades	32.6726740584465	-115.501995930145	Add more train capacity	Improvements to rail corridor could increase freight rail traffic through Mexicali and reduce truck traffic.
17-4-2023 17:30:16	Other Solutions	33.4185302103217	-117.143334682656	New Temecula-San Diego rail corridor	Expand rail corridor south from Perris for both freight and passenger service

18-4-2023 17:26:31	Rerouting Truck Trips & Parking	32.6385979415369	-117.071883575371	Truck parking & fuel outside cities	
18-4-2023 17:27:00	Other Solutions	32.6871549644547	-116.989486114433	new off ramp to port district	
18-4-2023 17:27:19	Problems Happening Now	32.7587861391192	-117.143294708183	Other (Describe)	All of the listed issues are occurring.
20-4-2023 20:24:47	Sustainable Upgrades	32.6906223136115	-117.129905120781	Clean up Port operations	our neighborhood deserves to breathe better.
20-4-2023 20:24:52	Problems Happening Now	32.6935116683801	-117.136599914482		too many trucks on our streets
20-4-2023 20:50:30	Problems Happening Now	32.6954113827323	-117.139491489668		Trucks idling, delivering goods to warehouses on Newton/Sicard St. These warehouses operate in a residential community directly across the street from senior housing and a pre-school.
20-4-2023 20:51:39	Problems Happening Now	32.6986256116169	-117.144555500288		Trucks going to the port cut through Cesar Chavez Pkwy and other parts of Barrio Logan to get to the terminal.
20-4-2023 20:54:40	Other Solutions	32.5679777637965	-116.963680725013	Charging area for warehouse fleets / Brown field Airport	This area seems far enough from residential homes to ease concerns about "truck magnets" and it is a close distance from mega warehouse facilities in otay and cross border activities.

20-4-2023 20:58:49	Problems Happening Now	32.5608019360087	-116.974152069008		Concerned about housing communities being developed along the 905 truck route. Millions of trucks travel through this corridor every year and I'm concerned that we are creating EJ communities in our south bay region.
20-4-2023 21:09:45	Other Solutions	32.9750225605141	-117.254852014835	Heavy Duty Truck Charging Infrastructure	The Del Mar Fair Grounds can be an excellent area for trucks to be able to charge. It's near the 5 frwy corridor and it is not close to residences.
20-4-2023 21:10:31	Problems Happening Now	32.6857319674904	-117.131004884818	Other (Describe)	Concerned that charging infrastructure in Logan or West National City will create a magnet that would attract more trucks to our communities.
20-4-2023 21:11:55	How Highways/Roads Are Used	89.9999995347887	-116.780405315868		Si hay normas y regulacion en tiempos que la gente sale del trabajo y no circulen camiones es mas facil llegar a casa y que no alla congestionamientos solo usar carriles especiales ya que lis camiones transitan en todos
20-4-2023 21:12:52	Other Solutions	32.6570633477715	-117.085891792403	Targeted Charging Infrastructure	Like shorepower in our port. Require that truck centric businesses like Walmart/Target/Cost co and others install chargers at each of

					their facilities so that electric delivery trucks can charge while off loading goods.
20-4-2023 21:14:45	Sustainable Upgrades	32.7052636768672	- 117.138076850997		
20-4-2023 21:15:14	Rerouting Truck Trips & Parking	32.7094236532427	- 117.14013678752	Zero or Low-Emission area trucks can't go	The Portside Neighborhoods should be ZE areas. Partnerships with local businesses should be made to make sure that trucks used to deliver goods in these neighborhoods (and all neighborhoods in the top 25% in CalEnviroscreen) are ZE.

Appendix F:

Focus Groups Summary

2/14/23

San Diego and Imperial County Sustainable Freight Implementation Plan

Focus Groups Summary

Cook + Schmid and WSP organized four focus groups in January 2023 to gain input on existing and proposed sustainable freight strategies, addressing equity, workforce development issues, and improving economic competitiveness. What follows is a summary of the input from the four focus groups.

Focus Group 1: San Diego County Environmental, Health, and Community Organizations

This focus group contained experts from San Diego County environmental, health, and community organizations. These experts offered input on existing and proposed sustainable freight strategies and how they might be implemented in San Diego County.

Participants in Focus Group 1:

- Daniel Hernandez (he/him), Director of Community Relations, San Ysidro Health
- Corinna Contreras (she/her), Transportation Policy Advocate, Climate Action Campaign
- Nicholas Paul (he/him), Air Quality Advocate, Environmental Health Coalition
- Meli Morales (they/them), Port Advocate, Environmental Health Coalition
- Melina Meza (she/her), San Diego County Air Pollution Control District

Main Points from Focus Group 1:

- Community Involvement in Implementation
 - The communities where these strategies may be implemented need to be educated on these strategies, and there needs to be time for input from community members.
 - Community members can aid in identifying possible hidden impacts of freight strategies before implementation so that they can be addressed.
 - New sustainable energy jobs will need to be created to sustain the new strategies. These jobs should be filled by the communities that have been the most impacted by freight emissions, in order to stimulate their economy and pursue equity.
- Idling Reduction Technology
 - Truck idling is a big problem in communities where trucks park, especially when they park next to schools (ex. Barrio Logan).
 - This technology should be implemented as soon as possible.

- Alternative Fuels
 - Due to negative impacts on the environment and community health, biofuel and hydrogen fuel were not considered beneficial sustainable energy strategies.
- Last Mile Improvements and Urban Consolidation
 - Both strategies were seen as important, but there was pushback on the potential locations that were suggested within the presentation as pilot locations for these strategies. No alternatives were given.
- Truck Parking
 - It was suggested that rooftop solar panels be implemented on truck parking facilities.
 - It would be beneficial to consider locations in San Diego that could be dual use parking opportunities. San Diego State, UCSD, and stadium parking were given as examples of seasonally used parking areas that could be upgraded and used for truck parking.
- Involving Youth
 - It is vital to educate and involve the youth in San Diego communities on these emerging sustainability strategies. This will expose them to future new career paths and increase public engagement.

Discussion 1: Existing Projects

Rail Projects

The participants in this focus group were excited about the possibility of rail projects. Moving more freight over to rail was perceived as creating fewer idling cars and freight trucks and therefore as being beneficial to San Diego communities. Rail expansion could also give pedestrians and cyclists more mobility in Encinitas and El Portal. There was curiosity in terms of how feasible the desert line expansion might be, given its lengthy history.

Complete Corridor and Highway Projects

There was some concern on how managed lanes might increase trucking and might impact air quality and congestion.

Parking Projects

There needs to be a good amount of discernment when choosing the locations for parking projects since they can inadvertently create magnet locations for trucks and therefore increase traffic within certain communities.

Community Input

There needs to be a process in place where potential sustainable freight strategies can receive input from the specific community it will impact before implementation. There can often be unintended consequences of implementation, an example given was with 'electrification structures.' Because of the potential community impact, it is necessary to involve residents and stakeholders and hold discussions about the specific costs and benefits of the potential strategy.

Addressing Equity

The participants encourage SANDAG and partners to extend the economic benefits of these new freight strategies to the communities who have been most negatively affected by freight emissions. These communities often have a lower socioeconomic status and could benefit from increased clean energy jobs. One neighborhood that has been affected by freight in San Diego is Barrio Logan. Environmental justice involves creating jobs within the sustainable freight industry in these highly impacted neighborhoods.

Discussion 2: Proposed Projects, Technology Solutions

Truck Platooning

There were questions and concerns with how truck platooning might work when it comes to cross-border goods and how they would get through customs. It was explained that this freight strategy would just be within the US for now, they aren't certain how this could look in the future.

Idling Reduction Technology

Barrio Logan was noted as a community that has been negatively impacted by idling trucks. This is especially a problem when trucks park near schools. There was some concern that private truck stops won't have enough incentive to provide idling reduction technology and that it may be too expensive to provide.

Idling reduction technology was overall seen by the focus group as a great proposed project, and one that should be implemented sooner than later.

Alternative Fuels

There was concern with 'alternative fuels' as an 'environmental strategy' because biofuels are worse for the environment and worse for the health of communities.

The interest in hydrogen as an alternative to electrifying trucks was also concerning to those in this focus group. A focus group member noted that hydrogen fuel is still hazardous and does have a negative cost for communities.

Discussion 3: Proposed Projects, Fleet Management and Operations Strategies

Last-Mile Improvements

The locations presented for cargo bikes and delivery lockers included Hillcrest, North Park, and San Diego. Some participants felt as though these locations already have many alternative delivery modes and systems in place. This is not where the need for last-mile improvements is the greatest. Locker systems were also noted to not be the best method because many packages don't fit into the lockers which can lead to a pile up of packages outside the lockers and therefore stolen or missing packages.

There was also a concern about how increased cargo bikes might interfere with other bicycle traffic in the region.

Urban Consolidation

The locations presented for Urban Consolidation included Downtown San Diego or Midway. Participants said that Midway District is already a high-traffic area, and there already isn't much space, so it might not be the best location for this strategy.

Public Input

Participants again state that communities need to be educated and then have a platform to provide input on these strategies before they are implemented. This information needs to be more accessible to the public. This whole process needs to be slow so that there is time for resident involvement.

Rail

One participant was interested in rail as the main long-term solution to cleaner freight movement stating that rail would reduce pollution, congestion, and have less impact on communities. It was explained that 70 to 80% of all freight is moved by truck at some point because it is more flexible and cost-effective for short and medium length trips, which is why so many strategies are focused on making trucks more sustainable.

Discussion 4: Proposed Projects, Infrastructure Improvement Strategies

Intelligent Transportation Systems (ITS)

There was concern from focus group members about what kind of data collection ITS and Smart Border Coalition would collect. There was a push for agencies to think about the potential unintended consequences of collecting so much trucking data.

Truck Parking

It was suggested that truck parking and charging stations include rooftop solar panels as a part of their construction in order to increase focus on sustainability and reduce environmental impact. Truck parking was seen as beneficial to bolster the charging infrastructure development.

In terms of truck parking locations, the project should consider locations in San Diego that could be dual use. There could be partnerships created with San Diego State, UCSD, local stadiums, and other seasonally used mass-parking spaces to make up for the current lack of parking. This way new structures wouldn't have to be built, but rather could use and upgrade infrastructure that already exists.

Final Discussion: Concluding Thoughts

Involving Youth

This focus group agreed that it is vital to engage the youth in San Diego on these new sustainable freight strategies. The youth today will be critical to ensuring that we have the infrastructure for clean energy jobs to be fulfilled in the future. By educating the youth now, they can be exposed to these new career paths, which will benefit San Diego's communities for years to come. It was also expressed that there should be a prioritization of educating the youth in communities that have been more negatively impacted by environmental degradation and freight emissions.

Focus Group 2: Imperial County Environmental and Community Groups

This focus group contained experts from Imperial County environmental and community groups. These experts offered input on existing and proposed sustainable freight strategies and how they might be implemented in Imperial County.

Participants in Focus Group 2:

- Blanca Morales, CEO of Calexico Wellness Center, President of Southern California Physicians Services
- Christian Torres, Salud Sin Fronteras
- Sal Saldivar, Manager of Operations, Calexico, Southern California Physician Services
- David Aguirre, ICTC
- Virginia Mendoza, ICTC
- Belen Leon-Lopez, Air Pollution Control Officer, ICAPCD
- Luis Olmedo, Executive Director, Comite Civico del Valle (CCV)

Main Points from Focus Group 2:

- Rail Projects
 - Expanding rail systems would be beneficial not only for sustainable freight but also for moving people. If people can be moved more efficiently by train, this could stimulate the Imperial County economy and population while also reducing emissions from passenger vehicles.
- Technology, Fleet Management and Operations Strategies
 - Proposed Locations: Major freight corridors like the I-8 or Highway 1-11, State Route 7, State Route 98, 115
- Truck Parking
 - Proposed locations: North end of Calexico, SR7
- Border Emissions
 - Reduction of emissions caused by daily border crossings by both freight and passenger vehicles is a top priority for many leaders in Imperial County because of the way emissions negatively affect border communities, like Calexico, within Imperial County.
 - Imperial County leaders want to see project brainstorm innovative and immediate strategies to address border emissions beyond just ITS.
- Lack of Infrastructure
 - Imperial County is far behind a lot of counties in terms of sustainability and clean energy infrastructure. There is a great need for more infrastructure including, but not limited to, charging stations and truck parking.
 - Charging Stations
 - When building these charging stations, they should be multi-use for both trucks and cars. The demand for charging stations is growing as California gets closer to their zero-emissions goal. Imperial County needs to plan for the future.
- Implementation

- Imperial County does not have the vast amount of resources and time that other counties may have, they are already stretched thin. A lot of these sustainable freight strategies sound great on paper, but might be hard to implement, especially with a lack of staffing and resources. There needs to be a focus on feasibility.
- Community Involvement
 - Communities should be educated and involved in the implementation process of these emerging strategies. New jobs should be created to stimulate the Imperial County economy.

Opening Discussion:

- “Increasing sustainable freight will be especially beneficial in heavy traffic corridors like the East Port of Entry and Calexico.”

Discussion 1: Existing Projects

Rail Projects

Trains are not only beneficial to move freight more efficiently and sustainably, but also to move people. The Imperial County needs to expand its rail systems in order to grow the local economy and population by allowing people to live in Imperial County and work in San Diego.

Freight Traffic

Truck traffic inequitably affects environmental justice communities when they pass through housing areas like Calexico. This focus group noted the urgency to bring these strategies to fruition to meet California’s zero-emission standards and to aid communities.

Truck Parking Projects

It was noted that there is often a lack of truck parking in residential areas which can lead to idling near houses overnight.

Discussion 2: Proposed Projects, Technology Solutions

Technology Solutions

One potential pilot location for the technology solutions was the SR7 corridor which already has a large commercial freight infrastructure network and major trucking traffic.

Another proposed location was the I-8 or Highway 111.

Lack of Infrastructure and the need for Specialized Strategies

Participants expressed that Imperial County has often been left out of new green strategies because it doesn’t currently have the infrastructure to support them. Sustainability strategies need to be

specialized to each community, and they need to be understood and approved by the communities they will affect.

There needs to be special consideration of the weather in Imperial County and what technology is realistic considering how hot it gets in the summer months.

The Border

This focus group mentioned how many emissions are caused by idling at the border. One suggestion for solving this issue was a system similar to a car wash. The idea was that the border could have a track that trucks could drive on to and then turn off their vehicles so that they aren't emitting so much while they are in line to cross the border. The system would move the trucks forward, like in a car wash.

In Imperial County, border crossing emission issues, which negatively impact border communities both in Mexico and the US, seem to be top of mind. Imperial County leaders want to see sustainability strategies that target border crossing emissions.

Discussion 3: Proposed Projects, Fleet Management and Operations Strategies

Charging Stations

The I-8 highway and other rest areas need to start building this kind of infrastructure. These charging stations could be used not only by trucks but also by cars as this kind of infrastructure will become more and more in demand with California's zero-emissions plans. It is important to start sooner than later.

Toll Roads

The funds from toll roads could be used to incentivize greener energy and make the transition to clean energy smoother. But, as of right now, Imperial County doesn't have any managed lanes, toll lanes, or toll operations at the border that could be used to fund sustainability. This strategy might work better in San Diego but is not currently feasible in Imperial County.

Implementation

These proposed projects all sound great, but the participants had some concern with how they might be implemented. Imperial County has a lack of institutional capacity and often struggles with implementing programs that might seem great on paper but take a lot of time and money. Imperial County doesn't have the infrastructure that makes these strategies easily implemented like San Diego does. Imperial county will need more help in 'catching up' to other cities on sustainable strategy implementation.

Lack of Infrastructure

There is a big inequality issue in Imperial County. Imperial county has one of the largest lithium mines in California, which will be beneficial for clean energy in the future, yet it has very little EV infrastructure. There needs to be a focus on building more infrastructure in the Imperial County.

Lack of equity

There was frustration that all examples in the presentation were from San Diego. Some participants felt as though this plan was not customized to bring about equity in Imperial County or address its needs. It was emphasized that the Imperial County is not San Diego, and that strategies would need to be customized to address the specific condition here.

Discussion 4: Proposed Projects, Infrastructure Improvement Strategies

Intelligent Transportation Systems

One participant suggested that these proposed systems were a ‘band-aid solution’ to border emissions, but not a real fix. This participant expressed frustration with the provision of wait times, variable tolling, and reservations as negatively impacting those who must travel at certain times and can’t afford to pay. This participant suggested opening more lanes at the border or introducing technology that will allow people to move more quickly and easily across the border.

Other focus group members liked the idea of ITS and explained that it is already being considered by Calxico, CBP, and Imperial County to help alleviate the Downtown Port, East Port, etc.

ITS needs to be evaluated further on how it might impact Imperial County and passenger vehicles.

It was implied that more technology is needed at the border and strategies to lower crossing border emissions should be a top priority in Imperial County.

Final Discussion: Concluding Thoughts

Imperial County is Not San Diego

Imperial County is a very different community than San Diego, and so the approach to Imperial County’s feasible sustainable strategies will be a different than San Diego’s. It is important to improve Imperial County’s infrastructure and reduce border emissions. Overall, the leaders in Imperial County are excited about the proposed projects, they just want Imperial county’s specific needs to be seen and addressed.

The Border

Border crossing emissions caused by idling freight and passenger vehicles is a massive problem within the Imperial County that needs immediate attention and innovative solutions.

Focus Group 3: Workforce Development

This focus group contained community leaders that represent economic/workforce development groups and labor groups.

Participants in Focus Group 3:

- Priscilla Lopez, Director of Imperial County Workforce Development Board
- Leo Medina, Southwestern Community College
- Cristina Marquez, International Brotherhood of Electrical Workers (IBEW)
- Efrain Silva, Dean of Economic and Workforce Development, Imperial Valley College
- Gabriel Aguirre, Imperial Valley Regional Occupation Program (IVROP)
- Jonathan Kropp, Miramar College
- Carlos Lopez, Imperial County Workforce Development Board

Main Points from Focus Group 3:

- Funding
 - One way to support workforce development is to provide funding for high-level training in emerging industries.
- High School Involvement
 - High schoolers need to be educated on these emerging industries and understand that there is a need for workers within these sectors. This will account for any workforce gaps that could occur in the future.
- Studying Job Demand
 - There needs to be data-backed research to show that there will be a need for workers in each of these emerging industries before workforce training can happen. There needs to be enough demand for jobs to justify training programs.
 - There also needs to be a study on what skills from other industries might be transferable to new emerging industries.
- Proposed Projects
 - Last-mile improvements are a great way to connect students and future workers to employers.
 - Zero-emission and low-emission zones are necessary to promote environmental equity.
 - IBEW has had Intelligent Transportation Systems (ITS) training programs active in the past that are now dormant but can be revived if there is a demand for more jobs in this sector.
 - Truck parking could create beneficial peripheral job networks that can stimulate local economies.
- Outreach to the Community
 - Many community members don't know about these emerging industries or the high-paying jobs that they could provide.
 - There needs to be a campaign to the community, and especially to underrepresented people in these communities, to join these emerging workforces.
- Lack of Instructors

- Some industries already have enough potential workers interested in joining the workforce, but there is a lack of training instructors which leads to a waitlist.

Discussion 1: Introductory Comments

Constituencies

These participants support workforce development in disadvantaged communities in San Diego County and Imperial County. Their focus is on equipping adults and students (14 to 24) to enter a trade.

Targeted trade sectors include:

- Electrical industry (EV charging stations)
- Green energy (lithium, geothermal)
- Automotive (truck drivers)

Training currently provided by these organizations:

- Workforce training
 - Layoff aversion, hands-on work experience
- Mentoring
- Internships
- Certifications and contracts
- Apprenticeships
- Re-skilling and up-skilling
- Reentering the workforce from out of state/out of country
- Career specific tutoring
- On the job training

Funding for these organizations comes from:

- Union Member Fees
- Apportionment (California Chancellor's Office)
- Collaboration with local stakeholders
- Organizations throughout the county
- Local School Districts
- Strong Workforce (the state of CA)
- CA Energy Commission

In this introductory discussion, participants explained the increasing need for a specialized workforce that can cater to the qualifications required in many current and upcoming green energy jobs. Most importantly, the participants want these companies to be able to hire workers from the local population, and not bring in workers from out of state. These organizations work to coordinate with new industries looking for a workforce. The main problem voiced by all participants was the lack of funding and resources available to them to properly educate students in these fields, particularly in Imperial County.

Discussion 2: Existing Projects Discussion

Participants suggested truck lanes and rail improvements as beneficial to communities and the freight industry.

Infrastructure Challenges

It was noted that Imperial County has a lack of infrastructure when it comes to electrical vehicle (EV) charging stations. If EV charging stations and other infrastructure could be implemented in the Imperial County this would create a more equitable environment for the Imperial County.

There is also a lack of appropriate equipment and space for workforce development training in Imperial County.

Funding Challenges

One of the biggest challenges for the workforce development sector is acquiring funding in order to provide high-level training with updated technology. Funding restrictions can make it hard to use the funding for needs in specialized fields, for example, or for identifying job seekers. It is vital that there is collaboration with local agencies to assess the workforce need and therefore use the grant money properly.

High School Recruitment

There needs to be a larger focus on educating high school students on these new green initiatives. There is also a need for more hands-on programs and training for high school students so that they can be aware of this new emerging green energy sector. There will be a need for an increased workforce in order to fulfill the new jobs that are created by these existing and proposed projects. Ideally, these jobs would be given to those already in the community.

Holistic Workforce Development

It appears that there are already workforce development programs in place that will account for the building of new green infrastructure. It was suggested that a wholistic approach be used for future training. A wholistic approach includes promoting existing programs to disadvantaged communities and the creation of specialized training programs by working with employers. This method will be helpful in ensuring that workers have the unique skills needed for zero-emissions programs. Collaboration with specific employers is vital for effective training.

One organization (IBEW) has already trained 600 people in their electrical vehicle training program (EVITP).

Imperial County Initiatives

In Imperial County, some new training programs will be launched within the coming years to respond to the regional emerging industries associated with Lithium production. These include:

- Plant Operator Program
- Instrumentation Technician Program
- Chemical Lab Technician Program
- Plant Mechanic Program

Partnerships

It was suggested that those interesting in promoting rail partner with other regions around the country that already have extensive infrastructure built. Suggested cities included LA, Chicago, and New York.

Sector Strategy Report

This study was suggested as a resource for developing sustainable freight strategies and understanding the current workforce need.

- San Diego-Imperial Counties Region, Zero-Emission Vehicles Medium- and Heavy-Duty Sector Strategy Report: <https://workforce.org/reports/2022/09/18/strategy-guidebook-promoting-careers-in-electric-mobility-3/>
- https://workforce.org/wp-content/uploads/2022/09/Strategy-Guidebook_Promoting-Careers-in-Electric-Mobility.pdf

Discussion 3: Technology Strategies Discussion

Jobs After Training

All participants said that one of the most important things to them was ensuring that upon completion of training, their constituents would have a job waiting for them. In order to do this, the organizations conduct enough research/collect enough data to make sure these sectors will have jobs that need to be filled. There needs to be a data-backed guarantee of work opportunities after training in order for a program's funding to be justified and realized.

One industry that was mentioned as having many possible job opportunities after training was Logistics.

The 'Regional Advisory Committee' was noted as a successful forum for discussion in this arena.

Workforce Sustainability: Truck Drivers

There is a lack of truck drivers within the trucking industry. One big concern for truck drivers that participate in workforce training is that they will be away from their families too much. In order to attract more truck drivers, truck driving needs to be more sustainable. One way to do this could be to create shorter and more efficient routes for truck drivers and allow them to be at home more often. If we factor sustainability into the picture now, this could address the current lack of truck driving work force and help plan for the future.

Discussion 4: Fleet Management and Operations Strategies Discussion

Last-Mile Improvements

Participants stated that it was important for students and future workers to get exposure to employers before getting a job in their sector, and last-mile improvements are a great way to encourage this connection.

Zero-Emission and Low-Emission Zones

These zones received approval and support from this focus group. It was emphasized that lower income communities are the ones most affected by high-freight trucking zones. An example given was Barrio Logan. It is important that these communities be given a voice.

Campaigning to Communities

One of the biggest obstacles to emerging operations is that some people are not aware that these jobs exist and are in need of workers. People in the community don't know about these high-paying job opportunities and these innovative careers. One example given to combat this obstacle would be to engage communities and jobseekers by campaigning to the community and getting the word out about these jobs.

Discussion 5: Infrastructure Improvement Strategies

Intelligent Transportation Systems (ITS)

One organization mentioned that they did have ITS training for a couple years, but it has dwindled and is currently dormant. The participants mentioned that they would be happy to bring back their ITS program at any time if the need arises for more workers.

Alternative Fueling

One participant asked whether hydrogen fueling was coming and noted that they could ramp up for that, if needed.

Truck Parking and Job Networks

Increasing the amount of truck parking facilities could lead to a peripheral job network. There would be a need for security, workers to sustain the lots, and possibly vendors who would all benefit from increased truck parking. This would create more jobs and stimulate economic growth.

Discussion 6: Final Thoughts, Underrepresented Groups

Outreach

The participants expressed that outreach is the main contributor to their obstacles; potential workers simply don't know what jobs are available. Multiple organizations are working on investing in an outreach program to involve those who are underrepresented in their communities.

Best Practices

San Diego Community College, with money from the region, is working on providing specific counseling, for example career-specific counseling and tutoring, which is known to help underrepresented students. They are also building a 'Best Practices' method on how to increase representation and invite people into the workforce. IBEW is developing a "pre-application" program that would directly link BIPOC, Native American, women and other individuals from underrepresented communities into apprenticeships. IVROP suggested reaching out to youth with the message that this field has multiple career options and these are safe and accessible choices. Southwest Community College has found that non-credit and ESL programs can be a good entry point for first generation students. Advertising programs that don't require English and emphasizing transferrable skills are other recommended approaches when trying to increase participation by underrepresented communities.

Lack of Instructors

Another barrier is the fact that some industries like Logistics careers do have enough students signed up for classes, but they lack enough instructors to teach them, which creates a waiting list for potential workers.

Transferrable Skills

One participant mentioned how it is important for workforce developers to recognize which skills are transferrable from one industry to another. These skills can be capitalized on and help fulfill the need for workers in emerging sectors and provide jobs for those in dying sectors.

The participants listed the underrepresented populations they are actively trying to increase access for, including:

- Women or Men (depending on the industry)
- Non-native English speakers
- Those who don't speak English
- BIPOC
- Tribal
- Neurodiverse
- Veterans
- Retired people
- First generation college students
- Single parents
- Homeless
- Youth in foster care
- Youth from economically disadvantaged families
- Individuals with disabilities
- Out of workforce individuals

A group called Women in Logistics was referenced as a good resource.

Focus Group 4: Freight Industry Representative

This focus group contained representatives from freight-related industries, both in the private and government sector. These experts offered input on existing and proposed sustainable freight strategies and how they might be implemented.

Participants in Focus Group 4:

- Gustavo De La Fuente, Former Executive Director, Current Board Member, Smart Border Coalition
- Alejandra Mier y Teran, Otay Mesa Chamber of Commerce
- Andrea Hoff, Senior Project Manager, Otay Mesa East Port of Entry Project at SANDAG
- Heather Hickerson, Governor's Office of Business and Economic Development
- Katherine Garrison, CA Air Resource Board Transportation and Toxics Division (CARB)
- Luis Carrillo, General Manager, Ground Express Transport
- Alyssa Valentine, Manager, Terminalift and Discount Heavy Haul
- Ty Manzo, Sutra Research and Otay Mesa East Crossing, owner of a small trucking company, former truck driver
- Aaron Bennett, Patterson Heavy Haul and BST Line Haul, part owner (both)
- Israel Delgado, Representative, CANACAR--Mexican Trucking Association in Baja California
- Bryan Keegan, Ventura Transfer Company
- Allen Vigil, Charger Logistics

Main Points from Focus Group 4:

- Lack of Infrastructure
 - There is a lack of road and bridge infrastructure for heavy haul freight movement.
 - There are no zero emissions charging stations in Otay Mesa. Other ports of entry also lack this type of infrastructure. More infrastructure should be constructed as soon as possible to account for trucks crossing the border in this region.
 - Truck Parking
 - More truck parking infrastructure is needed along with zero emissions facilities.
 - Information regarding truck parking could be distributed virtually to improve efficiency.
 - Proposed locations: I-8 corridor, I-5, I-15, 1-11, 86, Forrester Road, Caltrans District 11 (San Diego and Imperial County)
 - Independently opened Truck Stops could help with infrastructure gaps.
- Zero Emissions Technology
 - An approach lane will be built between the California Border Patrol (CBP) facility and the Commercial Vehicle Enforcement Facility.
 - Zero emissions technology should be suggested now as part of the implementation of this design.
 - There needs to be flexibility when it comes to trucking companies complying with zero emissions standards; it is currently unrealistic for heavy haulers to electrify their trucks. Hydrogen is a more realistic technology for some truck types.
- Idling Reduction Technology

- There is a lack of zero emissions facilities on both sides of the border, and this could be concerning in the future.
- A reservation system was suggested for ports of entry to eliminate idling for trucks.
- Off Hours Deliveries (OHD)
 - One potential barrier to OHD is that receivers would have to be on board with this strategy and be ready to receive freight 24/7. If they were on board, this would be a great idea to relieve traffic and reduce emissions.
 - Proposed locations: Ports of Entry, Otay Mesa East
 - Shipments also require inspections, which usually happen between 9am and 6pm. If this time was extended, this could relieve the bottlenecks of inspections that happen during the day.
- Challenges
 - The Trucking Industry has a massive lack of trucks and truck drivers. This problem needs to be addressed soon. It might be better to wait until the technology gets better for implementation.
- Communication
 - It is important that truckers know about these emerging strategies so that they can take advantage of them and participate in these new systems
 - Manufacturers should be included in this conversation as they are one of the most affected parties by POE delays. Manufacturers' support and input could be beneficial for creating a feasible sustainable freight strategy.

Discussion 1: Existing Projects

One participant noted that all of these solutions are beneficial.

Truck Routes and Roads

There is a lack of infrastructure within California in terms of roads and bridges that trucks can use for freight movement. This causes many freight routes to be a lot longer than they need to be if there was better infrastructure, and results in more emissions. There needs to be more support at the State and Federal level for the heavy haul industry, particularly for permitting and routing issues relating to weight restrictions. Fixing roads and expanding infrastructure will decrease emissions.

Proposed Locations: I-8 freeway

Truck Parking

Due to driving curfews, truckers find it difficult if not impossible to find parking, and often resort to parking on the side of the freeway or on onramps and offramps. This presents serious safety issues. Expanded truck parking is an immediate need in San Diego and the Imperial County.

There is a current need for expanded truck parking. Low emissions facilities and technology will soon be essential at parking structures as California transitions to zero-emission vehicles. Currently, the greatest need expressed was for staging areas in San Diego proper and many freight hub areas.

One proposed suggestion was that parking for trucks could be virtually distributed so that truckers could know when and where they would be parking each night. This strategy could increase efficiency.

Proposed Locations: I-8 corridor, I-5, I-15, 1-11, 86, Forester Road, Caltrans District 11 (San Diego and Imperial County)

Port of Entry

There are currently no zero emission charging stations in Otay Mesa for truck drivers coming from Mexico. Zero emissions charging stations are an immediate infrastructure need. This can be in preparation for the future emission regulations from the state and also because Baja California is not able to produce these stations, thus making an increased number of stations in Otay Mesa even more important. It was also asked why there have not been any recommendations for wireless charging in ports of entry, such as at the US/Mexico border.

Rail Projects

It was expressed that there is a hesitation to assume that moving freight by locomotive is more environmentally friendly than moving freight by trucks. One focus group member offered this link that compares Truck vs. Train Emissions: <https://ww2.arb.ca.gov/resources/fact-sheets/draft-truck-vs-train-emissions-analysis>

A Feasibility Study and Market Analysis will be conducted by either Caltrans or SANDAG that addresses the rehabilitation of the Desert Rail Line. Support was expressed for this feasibility study and rehabilitation of the Desert Line.

Discussion 2: Technology Strategies

Fuel Savings Technologies

It was expressed that there is a need for flexibility from the state when it comes to deadlines and regulations. For example, it is unrealistic to mandate that heavy haul trucks must meet complete electrification when the technology and infrastructure is not in place to handle their heavy loads. Hydrogen fueling was suggested as being more appropriate for heavy trucks than electric.

It was also stated that now is the time to provide input on the design for the approach lane that will be built between the California Border Patrol (CBP) facility and the Commercial Vehicle Enforcement Facility, and that it is important that it include wireless charging capabilities.

Truck Platooning and CAVs

Concern was expressed as to whether these technologies would be required. There was frustration and questioning over the need of the State of California's many regulations, especially when compared to the ease at which trucking companies can operate in all other states. Furthermore, there was also concern about further delays that could be caused by connecting trucks.

Idling Reduction Technology and Border Crossing

There was concern over the possible lack of zero emissions technology in Mexico. If the emissions issue is only addressed in California, there will still be many emissions at the border because the regulations are not synonymous in Mexico.

A supply chain reservation system was suggested to eliminate idling in cross-border freight movement.

Discussion 3: Fleet Management and Operations Strategies

Off Hour Deliveries (OHD)

It was suggested that the OHD strategy be pursued at ports of entry (Otay Mesa East) and other large facilities. It could be beneficial to launch a pilot program coordinating with CBP to use POE infrastructure in off hours in order to reduce traffic, but it this would require receivers and customers to be on board with this strategy as well. If receivers are unwilling to receive freight 24/7 then this will lead to more truck parking issues.

Current inspection hours are only between 9am and 6pm. Off-hour inspections could help to prevent bottlenecks at daytime inspections which lead to heavy emissions.

Urban consolidation

Urban consolidation is a good idea for smaller trucks that work with electrification, but bigger trucks will need other options.

Discussion 4: Infrastructure Improvement Strategies

Truck Stops

It was asked if San Diego allows independent truck stops to be opened and there was no conclusive answer given. Permitting is handled by cities and counties, depending on where the truck stops may be located. The participants seemed to believe that it would be beneficial if independent contractors could open more truck stops in order to supplement the lack of infrastructure.

Intelligent Transportation Systems (ITS)

It must be considered that a weigh-in motion system can be very inefficient and causes delays, due to current approach lane configurations. Therefore, the configuration of infrastructure and employment of the ITS needs to be coordinated together.

There is also support for virtual parking information and other virtual information systems. There is a lack of information dissemination to truckers that prevents them from utilizing available infrastructure.

Final Discussion: Concluding Thoughts

Manufacturers

In terms of economic competitiveness, manufacturers are the most effected by bottlenecks at the US/Mexico Ports of Entry. By bringing them into the conversation, these manufacturers could get on-board with these technologies because they will benefit from their implementation economically. This could also increase public support for sustainability strategies.

A supply chain impact study was suggested as possibly being beneficial. The necessity of a “seamless border”, with the expectation of no delays, is very important, and Mexican Customs also needs to give input.

Distribution of Technology

Many of the proposed technologies and infrastructure improvements sound very promising, but it is important that truckers know about them as they are implemented. If truckers don't know about these opportunities, they can't/won't get involved.

Challenges in the Trucking Industry

It was stressed that while technology is advancing, it may be better to wait for technology to improve and have a larger workforce available to employ this technology. The main need across the board is that there is a truck driver shortage. There is a lack of trucks and truck drivers that are not available in the workforce right now, and this problem needs to be addressed first and foremost.

Appendix G:

Final Benefits and Feasibility Scoring

Memorandum



SAN DIEGO AND IMPERIAL COUNTIES SUSTAINABLE FREIGHT IMPLEMENTATION STRATEGY

FINAL BENEFITS AND FEASIBILITY SCORING MEMORANDUM

September 2023

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1. PURPOSE AND SCOPE

As part of the San Diego and Imperial Counties Sustainable Freight Implementation Strategy, this Scoring memorandum documents the methodology and assumptions made to evaluate strategies for implementation. Strategies under consideration include projects, programs, and policies in San Diego and Imperial Counties. Each strategy was evaluated according to anticipated benefit and feasibility criteria outlined in the Existing Conditions and Sustainable Freight Best Practices memorandum. The criteria are described in Tables 1 and 2.

Table 1: Scoring of Benefits

Areas	Criteria	Scoring	Weighting
Environment	Impact on reducing emissions of GHGs	1 - 3	35%
	Impact on reducing emissions of criteria pollutants (particulate matter, NO _x , VOC, etc.)	1 - 3	
Equity	Degree to which benefits accrue to most vulnerable communities (Top 25% of CalEnviroScreen 4.0 scores, or AB 617), and vulnerable communities (Top 50% of CalEnviroScreen 4.0 scores, or Tribal Land), including safety considerations	1 - 3	35%
Economy	Improves efficiency (speeds and reliability) of freight transportation system	1 - 3	30%
	Improves capacity of freight system to accommodate expected increases in freight	1 - 3	

Table 2: Scoring of Feasibility

Areas	Criteria	Scoring	Weighting
Costs	Approximate implementation costs	1 - 3*	35%
Funding	Availability of funding	1 - 3	25%
Stakeholder Support	Support for implementation from stakeholders and legislative bodies	1 - 3	15%
Technological Complexity	Readiness of the required technology, including testing, development, and regulatory compliance	1 - 3	15%
Planning Continuity	Consistent with local or regional plans or programs and/or in alignment with other transportation modes	1 - 3	10%

**Costs scoring will be such that low-cost strategies are assigned a high score and high-cost strategies will receive a low score.*

A baseline score was determined for each project type, and scoring was then adjusted according to the location of the proposed project and other contextual details. Proposed policies and programs not defined by geographic locations were evaluated based on documented implementation outcomes in other cities, if available, and the best available information. Scores may change as more information is gathered and strategies are further defined in advance of implementation.

Scoring the benefits and feasibility of each strategy has resulted in an interactive tool that can be used to sort and filter them according to different priorities. Scores can be updated to respond to changing conditions. For example, new funding programs or technological improvements could elevate strategies that may not currently rise to the top of the priority list.

2. SCORING OF BENEFITS

2.1 Environment

Environment scores for proposed strategies were determined based on the potential to reduce emissions of greenhouse gases and criteria pollutants based on a typical application of the project as currently defined. A proposed project to provide zero-emissions charging/fueling infrastructure for trucks was given a baseline environment score of 3, given its potential to reduce emissions by supporting the transition of fossil fuel-powered trucks to zero-emission trucks. A proposed project with an uncertain net impact on emissions, such as changes to commercial port of entry processing technology, was given a baseline environment score of 2. Finally, a proposed project anticipated to increase emissions, such as a highway widening, was given a baseline environment score of 1.

2.2 Equity

Equity scores for proposed strategies were determined based on the degree to which benefits accrue to vulnerable communities. These communities were determined according to the top 25% (most vulnerable) and top 50% (vulnerable) of communities, as defined by [CalEnviroScreen 4.0](#). CalEnviroScreen 4.0 is also used for the evaluation of equity in SANDAG's 2021 Regional Plan. The definitions of most vulnerable and vulnerable also include communities designated through the [Assembly Bill \(AB\) 617 Community Air Protection Program](#) and tribal lands. Safety was also considered in this area of evaluation, with proposed strategies that improve safety resulting in higher scores.

A proposed project to provide zero-emissions charging/fueling infrastructure for trucks was given a baseline score of 3 for equity, given that reductions in emissions likely benefit vulnerable communities. If that zero-emissions charging/fueling infrastructure project were located close to sensitive land uses, its equity score was reduced to 2, as the project could attract more trucks than would otherwise be in that area. Converting existing trucks to zero-emissions would have a clear benefit to equity, but increasing the number of trucks in a vulnerable community could still contribute to noise and safety concerns from residents. A proposed project that would increase traffic speeds or volumes near most vulnerable and vulnerable communities would likely negatively impact those communities and be given a baseline score of 1.

2.3 Economy

Economy scores for proposed strategies were determined according to their potential to increase freight efficiency and capacity. Road widening, expansions of truck parking

facilities, and technology to reduce truck delays are example strategies assumed to have a strong economic benefit and be given a baseline score of 3. Proposed strategies with an uncertain economic benefit, such as temporary truck climbing lanes that do not significantly increase road capacity, were given a baseline score of 2. Proposed projects that would detour trucks around communities and increase the time or distance of travel would likely reduce freight efficiency and assigned a baseline score of 1.

3. SCORING OF FEASIBILITY

3.1 Cost

The proposed strategy list contains many projects that are conceptual in nature and have not been developed enough to have detailed cost estimates. However, the cost of a project is a significant factor when considering feasibility of implementation. Costs developed for this evaluation are high-level and based on available information, such as similar implementation in other cities. Similarly, costs for different strategies may vary for both capital costs or operations and maintenance costs. High level cost estimates were developed for all the strategies. The thresholds for high-, medium-, and low-cost strategies were then determined based on the distribution cost estimates. Approximately one-third of strategies were allocated into each scoring category. In general, strategies were considered low-cost and given a score of 1 if they cost up to \$10 million, medium-cost and given a score of 2 if they cost between \$10 and \$100 million, and high-cost and given a score of 3 if they cost greater than \$100 million to implement. These scores were used to avoid confusion. It should be noted that when determining overall weighted feasibility, the inverse scores were used in the calculation.

3.2 Funding Availability

SANDAG and ICTC monitor and evaluate numerous state and federal discretionary grant programs for their applicability to strategies that the agency is likely to pursue. Many of these programs are recurring, with new funding cycles being announced regularly. The project team assumed that these programs would continue to be available to fund proposed strategies. Grant program summaries were evaluated to determine at a high level if proposed strategies matched grant program eligibility requirements. If a strategy could be considered an eligible use of the funds according to the grant program summary, that was considered a match. Strategies with more matches were considered to have greater availability of discretionary funding than those strategies that had fewer matches. In total, 72 grant programs were evaluated. Strategies with 30 or fewer matches were considered to have low availability of funding and received a score of 1; strategies with 31 to 35 matches were considered to have medium availability of funding and received a score of 2, and strategies with 36 or more matches were considered to have high availability of funding and received a score of 3. As with the cost criteria, these thresholds were determined to result in a distribution of scores such that approximately one-third of the strategies would fall into each scoring category.

3.3 Stakeholder Support

Stakeholder support for proposed strategies was determined based on the outreach conducted throughout the project. The project team conducted interviews, focus groups, presentations, and surveys with a variety of stakeholders throughout San Diego and Imperial Counties. Qualitative feedback from the interviews and focus groups was evaluated in the context of proposed strategies, with dialogue supportive of a proposed strategy resulting in a score of 3, dialogue moderately supportive of a proposed strategy resulting in a score of 2, and dialogue unsupportive of a proposed strategy resulting in a score of 1. The online survey conducted in Spring 2023 also asked respondents to rate their approval or disapproval of proposed projects. This quantitative feedback was used to determine scores.

Policies and programs were less emphasized in the online survey conducted in Spring 2023. However, the project team conducted additional surveying during a presentation in July 2023 to the AB 617 Portside Community Steering Committee, a standing committee identified during the development of the Public Outreach Plan for project engagement. Quantitative and qualitative feedback from this presentation was used to score policies and programs, with supportive comments and scores resulting in a score of 3, moderately supportive comments and scores resulting in a score of 2, and unsupportive comments and scores resulting in a score of 1.

3.4 Technological Complexity

The technological complexity scoring category includes two primary components: the availability of required technology and the regulatory context. Many of the strategies considered for the Sustainable Freight Implementation Strategy are innovative and would rely on emerging technologies that may not yet be available for commercial use. The Existing Conditions and Sustainable Freight Best Practices memorandum and Innovative Strategies Screening memorandum describe numerous strategies being planned in peer cities to take advantage of new fuel types and increasingly sophisticated intelligent transportation systems, for example. The project team included such innovative concepts as appropriate for the regional context. However, strategies dependent on as-yet unproven technologies will likely require additional time or expense for implementation. Similarly, regulation relevant to strategy implementation was considered. Changing state or federal regulations and legislation requires time, expense, and political capital. Accordingly, strategies that require significant changes are considered to have an uncertain path toward implementation.

The two primary components of technological complexity were given equal weight in scoring. If a proposed strategy uses technology that is currently available and could be

implemented based on existing regulations and legislation, it received a score of 3. If one of those components is satisfied, the strategy received a score of 2. If the proposed strategy required both technology development and regulatory change, it received a score of 1.

3.5 Planning Continuity

Prioritizing consistency with adopted plans underscores the importance of prior planning work and supports the implementation of established goals, objectives, and implementation actions. To determine the consistency of proposed strategies, the project team reviewed numerous plans identified in the Project Management Plan Scope of Work, the Existing Conditions, and Sustainable Freight Best Practices memorandum. These documents were selected as being especially relevant to the development of a Sustainable Freight Implementation Strategy for San Diego and Imperial Counties and thus reflect a mix of overlapping geographies and focus areas. Documents considered include the following:

- California Sustainable Freight Action Plan
- California Statewide Truck Parking Study
- California Freight Mobility Plan 2020
- California-Baja California Border Master Plan 2021
- Port of San Diego Maritime Clean Air Strategy
- Portside Environmental Justice Neighborhoods Community Emissions Reduction Plan
- Calexico-El Centro-Heber Community Emissions Reduction Plan
- San Diego Regional Medium- and Heavy-Duty Zero-Emission Vehicle Blueprint Near- and Long-Term Implementation Strategies
- SANDAG/Caltrans District 11 South Bay to Sorrento, San Vicente, and North County Comprehensive Multimodal Corridor Plans
- SANDAG 2021 Regional Plan
- Southern California Association of Governments Connect SoCal 2020 Regional Transportation Plan/Sustainable Communities Strategy

These plans were reviewed to determine at a high level if the proposed strategies were consistent with documented goals, objectives, and implementation actions. A proposed strategy consistent with those documents was considered a match. Strategies with more matches were considered to have a greater level of planning continuity than those strategies that had fewer matches. In total, 11 documents were evaluated. Strategies with 2 or fewer matches were considered to have a low level of planning continuity and received a score of 1; strategies with 3 to 6 matches were considered to have a medium level of planning continuity and received a score of 2, and strategies with 7 or more matches were considered to have a high level of planning continuity and received a score of 3. As with the

cost and funding availability criteria, these thresholds were determined to result in a distribution of scores such that approximately one-third of the strategies fell into each scoring category.

As many of these planning documents are updated periodically, planning continuity is certain to change over time. This criterion, like the others, will be reevaluated as updated planning documents are published.

4. APPENDIX: SCORING MATRIX

Corridor	County	Start	End	Project Description	Project Type	Scoring of Benefits				Scoring of Feasibility					
						Environment	Equity	Economy	Benefits Weighted	Cost	Funding	S. Support	Tech Complexity	Planning Cont.	Opportunities/ Feasibility Weighted
Harbor Drive	SD	National City Marine Terminal		NCMT Truck Parking/ Staging - Truck parking and staging alternatives for NCMT, including but not limited to EV charging infrastructure	Marine, Truck Parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
I-8	SD	Greenfield Dr	Forrester Rd	Golden Acorn Casino & Travel Center: Expand truck parking, add amenities, ZE charging, onsite electric generation and storage. Supports I-8 Alternative Fuel Corridor	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
I-8	SD	Greenfield Dr	Forrester Rd	Buckman Springs Safety Roadside Rest Area: Expand truck parking, add amenities, ZE charging, onsite electric generation and storage. Supports I-8 Alternative Fuel Corridor	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
I-8	IC	Greenfield Dr	Forrester Rd	Sunbeam Safety Roadside Rest Area: Expand truck parking, add amenities, ZE charging, onsite electric generation and storage. Supports I-8 Alternative Fuel Corridor	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
I-8	IC	SR 7	State Line	Sand Hills Safety Roadside Rest Area: Expand truck parking, add amenities, ZE charging, onsite electric generation and storage. Supports I-8 Alternative Fuel Corridor	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
SR 7	IC	International Border	SR 98	Calexico East POE/Gateway of the Americas Specific Plan Area: Support for private development of ZE truck charging/parking/staging	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
SR 78	IC	SR 115	Riverside County line near Palo Verde	ZE infrastructure/truck parking/staging to support SR 78 Alternative Fuel Corridor	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
SR 86	IC	SR 78 S	SR 78 N	Support for private ZE infrastructure/truck parking/staging. Add ZE charging to existing Love's Travel Stop in Westmorland	Truck parking, ZEV	3	3	3	3	1	3	3	2	3	2.85
SR 188	SD	International Border	SR 98	Tecate POE: Border Wait Times - Install the remaining border wait times equipment (northbound) at all CA-BC land POEs, and Regional Border Management System	POE, ITS	3	3	3	3	1	2	3	3	3	2.75
SR 905	SD	SR 11	International Border	Otay Mesa POE: Border Wait Times and Regional Border Management System	POE, ITS	3	3	3	3	1	2	3	3	3	2.75
SR 11	SD	SR 125	International Border	Otay Mesa East POE: ZE truck charging/parking/staging	POE, ZEV, Truck Parking	3	3	3	3	1	3	3	1	3	2.7
SR 11	SD	SR 125	International Border	Otay Mesa East POE: wireless electric charging for trucks in queue	POE, ZEV	3	3	3	3	1	3	3	1	3	2.7
SR 188	SD	International Border	SR 98	Tecate POE: wireless electric charging for trucks in queue	POE, ZEV	3	3	3	3	1	3	3	1	3	2.7
SR 7	IC	International Border	SR 98	Calexico East POE: wireless electric charging for trucks in queue	POE, ZEV	3	3	3	3	1	3	3	1	3	2.7
SR 905	SD	SR 11	International Border	Otay Mesa POE: ZE truck charging/parking/staging	POE, ZEV, Truck Parking	3	3	3	3	1	3	3	1	3	2.7
SR 905	SD	SR 11	International Border	Otay Mesa POE: wireless electric charging for trucks in queue	POE, ZEV	3	3	3	3	1	3	3	1	3	2.7
SR 11	SD	SR 125	International Border	Otay Mesa East POE: Preclearance to accelerate processing time for trucks in coordination with other agencies/law enforcement per Border Master Plan white paper	POE	3	3	3	3	1	2	3	2	3	2.6
SR 188	SD	International Border	SR 98	Tecate POE: commercial vehicle appointment window system	POE, ITS	3	3	3	3	1	2	3	2	3	2.6
SR 188	SD	International Border	SR 98	Tecate POE: Preclearance to accelerate processing time for trucks in coordination with other agencies/law enforcement per Border Master Plan white paper	POE	3	3	3	3	1	2	3	2	3	2.6
SR 7	IC	International Border	SR 98	Calexico East POE: commercial vehicle appointment window system	POE, ITS	3	3	3	3	1	2	3	2	3	2.6
SR 905	SD	SR 11	International Border	Otay Mesa POE: commercial vehicle appointment window system	POE, ITS	3	3	3	3	1	2	3	2	3	2.6
SR 905	SD	SR 11	International Border	Otay Mesa POE: Preclearance to accelerate processing time for trucks in coordination with other agencies/law enforcement per Border Master Plan white paper	POE	3	3	3	3	1	2	3	2	3	2.6
Harbor Drive	SD	Tenth Avenue Marine Terminal		Tenth Avenue Marine Terminal Redevelopment Plan: Enhanced electrical infrastructure/equipment and enhanced and additional on-dock rail	Marine, Rail	3	3	3	3	2	3	3	3	2	2.55
SR 111	IC	SR 78	County Line	Two Rivers Safety Roadside Rest Area: Reopen, expand truck parking, add amenities, ZE charging, onsite electric generation and storage. This particular site may be infeasible to reopen in the near term, per Caltrans	Truck parking, ZEV	3	3	3	3	1	3	1	2	3	2.55

Corridor	County	Start	End	Project Description	Project Type	Scoring of Benefits				Scoring of Feasibility					
						Environment	Equity	Economy	Benefits Weighted	Cost	Funding	S. Support	Tech Complexity	Planning Cont.	Opportunities/ Feasibility Weighted
Harbor Drive	SD	Tenth Avenue Marine Terminal		TAMT commercial vehicle appointment window systems	Marine, ITS	3	3	3	3	1	1	3	3	3	2.5
Harbor Drive	SD	Tenth Avenue Marine Terminal		TAMT gate operating system	Marine, ITS	3	3	3	3	1	1	3	3	3	2.5
Harbor Drive	SD	National City Marine Terminal		NCMT commercial vehicle appointment window systems	Marine, ITS	3	3	3	3	1	1	3	3	3	2.5
Harbor Drive	SD	National City Marine Terminal		NCMT gate operating system	Marine, ITS	3	3	3	3	1	1	3	3	3	2.5
Harbor Drive	SD	Tenth Avenue Marine Terminal		TAMT Wireless charging for trucks	Marine, ZEV	3	3	3	3	1	2	3	1	3	2.45
Harbor Drive	SD	National City Marine Terminal		NCMT Wireless charging for trucks	Marine, ZEV	3	3	3	3	1	2	3	1	3	2.45
SR 11	SD	SR 125	International Border	Otay Mesa East POE: commercial vehicle appointment window system	POE, ITS	3	3	3	3	1	1	3	2	3	2.35
SR 11	SD	SR 125	International Border	Otay Mesa East POE: Unified cargo processing	POE	3	3	3	3	1	1	3	2	3	2.35
SR 188	SD	International Border	SR 98	Tecate POE: Unified cargo processing	POE	3	3	3	3	1	1	3	2	3	2.35
SR 7	IC	International Border	SR 98	Calexico East POE: Unified cargo processing	POE	3	3	3	3	1	1	3	2	3	2.35
SR 905	SD	SR 11	International Border	Otay Mesa POE: Unified cargo processing	POE	3	3	3	3	1	1	3	2	3	2.35
Tidelands Avenue	SD	National City Marine Terminal	Civic Center Drive	On-street truck parking with reservations	Truck parking	3	3	3	3	1	1	3	2	3	2.35
Harbor Drive	SD	National City Marine Terminal	Tenth Avenue Marine Terminal	Continuation of San Diego Working Waterfront Freight Signal Prioritization project (California Energy Commission pilot)	ITS	3	3	3	3	2	2	2	3	3	2.25
Harbor Drive	SD	National City Marine Terminal	Tenth Avenue Marine Terminal	Designated Freight Route (Harbor Drive 2.0): Dedicated lanes (where feasible) and signal priority for truck freight, queue jumps, delineators and signage.	Highway, ITS	3	3	3	3	2	2	2	3	3	2.25
SR 11	SD	SR 125	International Border	Otay Mesa East POE: Expanded hours for CBP/CVEF inspections	POE, Off hours	3	3	3	3	1	1	3	2	2	2.25
Harbor Drive	SD	Tenth Avenue Marine Terminal		TAMT Cargo Staging - TAMT marine cargo staging and handling projects, including but not limited to enhanced open storage, cargo handling infrastructure improvements, rail track improvements, deployment of zero-emission infrastructure and equipment, wharf reinforcements, on-dock shorepower, improvements to facilitate "marine highway" cargo, and front gate operational and technology enhancements	Marine, Rail, ITS	3	3	3	3	3	3	3	2	3	2.15
Harbor Drive	SD	National City Marine Terminal		National City Marine Terminal (NCMT) Marine Cargo Staging and Handling Projects, including but not limited to: enhanced technology and infrastructure to facilitate roll-on/roll-off cargo storage, wharf extension to create two new berths, improvements to facilitate "marine highway" cargo, cargo handling and at-berth electrification infrastructure improvements.	Marine, ITS	3	3	3	3	3	3	3	2	3	2.15
SR 11	SD	SR 125	International Border	Otay Mesa East POE: Border Wait Times - SR-11 tolling equipment, and Regional Border Management System	POE, ITS	3	3	3	3	2	1	3	3	3	2.15
I-5	SD	SR 905	Harbor Drive	SR 11, SR 905, and I-5, and Harbor Drive enhanced truck route: truck only (toll) lanes conversion. "truck flex lanes" connecting OME to Port of SD, where feasible	Highway	3	3	3	3	2	2	2	2	3	2.1
Cole Boulevard	IC	Dogwood Road	SR 98	Grade separations for UP Railroad	Grade separations	3	3	3	3	3	3	2	3	2	2.05
SR 98	IC	I-8 W	SR 111	Grade separations for UP Railroad	Grade separations	3	3	3	3	3	3	2	3	2	2.05
SR 11	SD	SR 125	International Border	Otay Mesa East POE: Non-intrusive inspections into POE operations - Coordination with law enforcement and other agencies	POE	3	3	3	3	2	1	3	2	3	2
SR 188	SD	International Border	SR 98	Tecate POE: Non-intrusive inspections into POE operations - Coordination with law enforcement and other agencies	POE	3	3	3	3	2	1	3	2	3	2
SR 7	IC	International Border	SR 98	Calexico East POE: Non-intrusive inspections into POE operations - Coordination with law enforcement and other agencies	POE	3	3	3	3	2	1	3	2	3	2
SR 905	SD	SR 11	International Border	Otay Mesa POE: Non-intrusive inspections into POE operations - Coordination with law enforcement and other agencies	POE	3	3	3	3	2	1	3	2	3	2

Corridor	County	Start	End	Project Description	Project Type	Scoring of Benefits				Scoring of Feasibility					
						Environment	Equity	Economy	Benefits Weighted	Cost	Funding	S. Support	Tech Complexity	Planning Cont.	Opportunities/ Feasibility Weighted
I-805	SD	SR 905	Palm Avenue	SR 905/I-805 dedicated truck lanes at heavy interchanges. convert 1 of 2 existing lanes on ramps to truck only	Highway	3	3	3	3	2	1	2	2	3	1.85
SR 52	SD	I-805	I-15	SR 52/I-805 dedicated truck lanes at heavy interchanges. Converting 1 of 2 ramp lanes to truck only	Highway	3	3	3	3	2	1	2	2	3	1.85
SR 905	SD	I-5	SR 11	SR 11, SR 905, and I-5, and Harbor Drive enhanced truck route: truck only (toll) lanes conversion	Highway	3	3	3	3	2	1	2	2	3	1.85
SR 188	SD	International Border	SR 98	Tecate POE: Expanded hours for CBP/CVEF inspections	POE, Off hours	3	3	3	3	2	1	2	2	2	1.75
SR 905	SD	SR 11	International Border	Otay Mesa POE: Expanded hours for CBP/CVEF inspections	POE, Off hours	3	3	3	3	2	1	2	2	2	1.75
SR 78	SD	Oceanside	Escondido	SPRINTER - LRT 399: Double-tracking and Grade Separations at El Camino Real, Melrose Dr, Vista Village Dr/ Main St, North Dr, Civic Center, Auto Parkway and Mission Ave	Grade separations/Rail	3	3	2	2.7	3	3	3	3	2	2.2
SR 78	SD	Oceanside	Escondido	Grade separations for SPRINTER	Grade separations/Rail	3	3	2	2.7	3	3	3	3	2	2.2
Aten Road	IC	SR 86	SR 111	Grade separations for UP Railroad	Grade separations	3	3	2	2.7	3	3	2	3	2	2.05
Dogwood Road	IC	SR 98	Malan Street	Grade separations for UP Railroad	Grade separations	3	3	2	2.7	3	3	2	3	2	2.05
Evan Hewes Highway	IC	SR 86	I-8	Grade separations for UP Railroad	Grade separations	3	3	2	2.7	3	3	2	3	2	2.05
Heber Road	IC	SR 86	SR 111	Grade separations for UP Railroad	Grade separations	3	3	2	2.7	3	3	2	3	2	2.05
I-5	SD	San Ysidro	Downtown San Diego	LRT 510 Blue Line Trolley/SDIY Freight Rail. Grade Separations at 28th St, 32nd St, E St, H St, Palomar St, and Blue/ Orange Track Connections at 12th/ Imperial	Grade separations	3	3	2	2.7	3	3	2	3	2	2.05
I-5	SD	San Diego	Old Town	Grade separations for LOSSAN	Grade separations	3	3	2	2.7	3	3	2	3	2	2.05
Keystone Road	IC	SR 86	SR 111	Grade separations for UP Railroad	Grade separations	3	3	2	2.7	3	3	2	3	2	2.05
Malan Street	IC	SR 86	SR 111	Grade separations for UP Railroad	Grade separations	3	3	2	2.7	3	3	2	3	2	2.05
Mead Road	IC	SR 86	SR 111	Grade separations for UP Railroad	Grade separations	3	3	2	2.7	3	3	2	3	2	2.05
Harbor Drive	SD	National City Marine Terminal		NCMT Freight Rail Improvements, including but not limited to: additional rail storage facilities in the vicinity of the balloon track, realignment of Marina way to create cargo buffer areas.	Marine, Rail	3	2	3	2.65	1	3	3	3	2	2.9
SR 86	IC	El Centro	Brawley	UP Railroad: New or expanded rail spurs for UP service per Mesquite Lake Specific Plan Area	Rail	3	2	3	2.65	1	3	3	3	2	2.9
Harbor Drive	SD	Tenth Avenue Marine Terminal		TAMT ZE truck charging/parking/staging	Marine, ZEV, Truck parking	3	2	3	2.65	1	3	3	2	3	2.85
I-15	SD	SR 76	County Line	At I-15/SR 76 Park and Ride: Expand truck parking, add amenities, on site storage ZE infrastructure/truck parking/staging to support alternative Fuel Corridor on I-15	Truck parking, ZEV	3	2	3	2.65	1	3	3	2	3	2.85
I-5	SD	I-805	County Line	Aliso Creek Safety Roadside Rest Area: Expand truck parking, add amenities, ZE charging, onsite electric generation and storage. Supports I-5 Alternative Fuel Corridor	Truck parking, ZEV	3	2	3	2.65	1	3	3	2	3	2.85
I-805	SD	Balboa Avenue	NB Bypass Lane	I-805/SR 52: ZE infrastructure/truck parking/staging	Truck parking, ZEV	3	2	3	2.65	1	3	3	2	3	2.85
SR 188	SD	International Border	SR 98	Tecate POE: ZE truck charging/parking/staging	POE, ZEV, Truck Parking	3	2	3	2.65	1	3	3	2	3	2.85
SR 52	SD	I-805	I-15	I-805/SR 52: ZE infrastructure/truck parking/staging	Truck parking, ZEV	3	2	3	2.65	1	3	3	2	3	2.85
SR 78	SD	SR 79 S	San Diego-Imperial County Line	ZE infrastructure/truck parking/staging to support SR 78 Alternative Fuel Corridor	Truck parking, ZEV	3	2	3	2.65	1	3	3	2	3	2.85
SR 78	IC	San Diego-Imperial County Line	SR 86 S	ZE infrastructure/truck parking/staging to support SR 78 Alternative Fuel Corridor	Truck parking, ZEV	3	2	3	2.65	1	3	3	2	3	2.85
Washington Street	SD	San Diego International Airport	I-5	Dedicated truck lanes/passing lanes and freight signal priority on arterials. Lane conversion to truck only, dependent on grade separation of railroad and trolley tracks	Highway, ITS	2	3	3	2.65	1	3	2	3	3	2.85

Corridor	County	Start	End	Project Description	Project Type	Scoring of Benefits				Scoring of Feasibility					
						Environment	Equity	Economy	Benefits Weighted	Cost	Funding	S. Support	Tech Complexity	Planning Cont.	Opportunities/ Feasibility Weighted
SR 11	SD	SR 125	International Border	Otay Mesa East POE: Off-peak, incentive-based pickup/delivery system for POEs, dependent on truck staging infrastructure	POE, Off hours	3	2	3	2.65	1	3	2	2	2	2.6
SR 7	IC	International Border	SR 98	Calexico East POE: Off-peak, incentive-based pickup/delivery system for POEs, dependent on truck staging infrastructure	POE, Off hours	3	2	3	2.65	1	3	2	2	2	2.6
Harbor Drive	SD	Tenth Avenue Marine Terminal		TAMT Freight Rail Improvements, including but not limited to: track repositioning, track upgrades and increased staging area for rail cargo and loading	Marine, rail	3	2	3	2.65	2	3	3	3	2	2.55
Heber Road	IC	SR 111	SR 7	Major East/West roads that connect to north south freight routes can benefit from infrastructure and IT improvements	ITS	2	3	3	2.65	2	3	2	3	3	2.5
SR 188	SD	International Border	SR 98	Tecate POE: Off-peak, incentive-based pickup/delivery system for POEs, dependent on truck staging infrastructure	POE, Off hours	3	2	3	2.65	1	2	2	2	2	2.35
SR 94	SD	Campo	Plaster City	U.S.: Desert Line Basic Service, Rehabilitation	Rail	3	2	3	2.65	3	3	3	3	2	2.2
SR 115	IC	I-8	SR 78	Dedicated truck lanes/passing lanes and freight signal priority on arterials	Highway, ITS	2	3	3	2.65	3	3	2	3	3	2.15
SR 905	SD	SR 11	International Border	Otay Mesa POE: Off-peak, incentive-based pickup/delivery system for POEs, dependent on truck staging infrastructure	POE, Off hours	3	2	3	2.65	1	1	2	2	2	2.1
SR 94	SD	Tijuana	Tecate	Mexico: Tijuana-Tecate Rail Line Improvements	Rail	3	2	3	2.65	3	1	3	2	2	1.55
SR 94	SD	Tecate	Campo	Tecate/Campo new rail POE, dependent on Desert Line Rehabilitation	Rail, POE	3	2	3	2.65	3	1	3	2	2	1.55
SR 7	IC	International Border	SR 98	Calexico East POE: Border Wait Times - Install the remaining border wait times equipment (northbound) at all CA-BC land POEs, and Regional Border Management System	POE, ITS	3	2	2	2.35	1	2	3	3	3	2.75
I-5	SD	Downtown San Diego	Oceanside	Commuter Rail 398 - includes upgrades to Pacific Surfliner/ COASTER/ Metrolink/ Freight LOSSAN services from Orange County to Downtown San Diego; add station at Gaslamp	Rail	3	2	2	2.35	3	3	3	3	2	2.2
I-5	SD	Miramar	Sorrento	LOSSAN: Sorrento to Miramar Phase 2	Rail	3	2	2	2.35	3	3	3	3	2	2.2
I-805	SD	Palm Avenue	H Street	Managed Lanes: GP conversion to ML	Highway	3	2	2	2.35	2	2	2	2	3	2.1
I-805	SD	I-8	Mesa College Drive	Managed Lanes: GP conversion to ML	Highway	3	2	2	2.35	2	2	2	2	3	2.1
I-5	SD	Downtown San Diego	Oceanside	Commuter Rail 398 - Build Del Mar tunnel, add stations at Central Mobility Hub and Camp Pendleton, and Grade Separation at Leucadia Blvd.	Rail, Grade Separations	3	2	2	2.35	3	3	3	2	2	2.05
I-5	SD	Downtown San Diego	Oceanside	Commuter Rail 398 - Build Sorrento Mesa and UTC tunnels, add station at Balboa Ave.	Rail	3	2	2	2.35	3	3	3	2	2	2.05
I-5	SD	Old Town	County Line	Grade separations for LOSSAN	Grade separations	3	2	2	2.35	3	3	2	3	2	2.05
I-5	SD	SR 905	SR 54	Managed Lanes on freeways with high truck volumes: GP conversion to ML	Highway	3	2	2	2.35	3	2	2	2	3	1.75
I-805	SD	H Street	I-15	Managed Lanes: GP conversion to ML	Highway	3	2	2	2.35	3	2	2	2	3	1.75
I-805	SD	Balboa Avenue	NB Bypass Lane	Managed Lanes: GP conversion to ML	Highway	3	2	2	2.35	3	2	2	2	3	1.75
SR 15	SD	I-805	I-8	Managed Lanes: GP conversion to ML	Highway	3	2	2	2.35	3	2	2	2	3	1.75
Evan Hewes Highway	IC	SR 86	I-8	Major East/West roads that connect to north south freight routes can benefit from infrastructure and IT improvements	ITS	2	2	3	2.3	1	2	2	3	3	2.6
SR 905	SD	SR 11	International Border	Otay Mesa POE: Commercial Vehicle Enforcement Facility (CVEF) modernization: Improvements to the CVEF to reflect GSA's proposed Otay Mesa POE Modernization Project	POE	2	2	3	2.3	1	1	3	3	3	2.5
Cole Boulevard	IC	Dogwood Road	SR 98	Major East/West roads that connect to north south freight routes can benefit from infrastructure and IT improvements	ITS	2	2	3	2.3	2	2	2	3	3	2.25
SR 905	SD	SR 11	International Border	Otay Mesa POE: Widened bridge between POE and CVEF to coincide with improvements at both facilities.	POE	2	2	3	2.3	2	1	3	3	3	2.15
Miramar Road	SD	I-805	I-15	Dedicated truck lanes/passing lanes and freight signal priority on arterials. Lane conversion to truck only	Highway, ITS	2	2	3	2.3	2	1	2	3	3	2
Palomar Airport Road/W San Marcos Boulevard	SD	I-5	SR 78	Dedicated truck lanes/passing lanes and freight signal priority on arterials. Lane conversion to truck only	Highway, ITS	2	2	3	2.3	2	1	2	3	3	2
Scripps Poway Parkway	SD	I-15	Community Road	Dedicated truck lanes/passing lanes and freight signal priority on arterials. Lane conversion to truck only	Highway, ITS	2	2	3	2.3	2	1	2	3	3	2

Corridor	County	Start	End	Project Description	Project Type	Scoring of Benefits				Scoring of Feasibility					
						Environment	Equity	Economy	Benefits Weighted	Cost	Funding	S. Support	Tech Complexity	Planning Cont.	Opportunities/ Feasibility Weighted
SR 78	IC	SR 86 S	SR 111 S	Westmorland Bypass - New four-lane expressway bypass route around the City of Westmorland with improved connections to Forrester Road, and redesignate this alignment as SR-78 (SCAG 2016 RTP/SCS)	Highway	2	2	3	2.3	2	1	2	3	3	2
SR 78	IC	SR 111 S	County Line	SR 78/SR 111 S/E Interchange: Grade Separations - Strategic	Grade separations	2	2	3	2.3	3	1	2	3	2	1.55
I-5	SD	National City	Downtown San Diego	Barrio Logan: Surfliner maintenance facility ZE locomotive fueling hub	Rail, ZEV	3	2	1	2.05	3	3	3	2	2	2.05
I-15	SD	I-8	SR 163	Snapdragon Stadium: Emergency/seasonal truck parking locations	Truck parking	2	2	2	2	1	3	3	3	3	3
I-5	SD	I-805	County Line	Del Mar Fairgrounds: Emergency/Seasonal truck parking location	Truck parking	2	2	2	2	1	3	3	3	3	3
Dogwood Road	IC	SR 98	Malan Street	Right turn and/or left turn lane pockets to minimize rear-end collisions	Highway	2	2	2	2	1	1	2	3	3	2.35
Forrester Road	IC	I-8	SR 78	Right turn and/or left turn lane pockets to minimize rear-end collisions	Highway	2	2	2	2	1	1	2	3	3	2.35
Worthington Road	IC	Forrester Road	SR 115	Right turn and/or left turn lane pockets to minimize rear-end collisions	Highway	2	2	2	2	1	1	2	3	3	2.35
Harbor Drive	SD	Civic Center Drive	32nd Street	Vesta Bridge - Phases 2 and 3: Harbor Drive to SR 15 ramps at 32nd St	Grade separations	2	2	2	2	3	3	2	3	2	2.05
SR 52	SD	I-15	SR 125	SR-52 Truck Climbing Lane/dedicated truck lanes on steep grades: expansion for temporary truck only lane	Highway	2	2	2	2	2	1	2	3	3	2
Dogwood Road	IC	SR 98	Malan Street	Passing lanes and intersection improvements	Highway	2	2	2	2	3	1	2	3	3	1.65
Forrester Road	IC	I-8	SR 78	Passing lanes and intersection improvements	Highway	2	2	2	2	3	1	2	3	3	1.65
SR 111	IC	SR 78	County Line	Brawley to Calipatria, from Calipatria to Niland and from Niland north to Riverside County line: Passing lanes and intersection improvements	Highway	2	2	2	2	3	1	2	3	3	1.65
SR 78	SD	I-5	I-15	SR 78 dedicated truck lanes at heavy interchanges	Highway	2	2	2	2	3	1	2	3	3	1.65
SR 78	IC	SR 115	Riverside County line near Palo Verde	Passing lanes and freight signal priority/intersection improvements	Highway	2	2	2	2	3	1	2	3	3	1.65
I-5	SD	SR 905	SR 54	Dedicated truck lanes on freeways with high truck volumes: expansion	Highway	1	2	3	1.95	2	1	2	2	3	1.85
SR 7	IC	International Border	SR 98	Calexico East POE Access Road Improvements - SR 7 Menvielle Road widening from 2 to 4 lanes from SR-98 to SR-7 SR-98 widening and operational improvements from Rockwood Avenue to SR-7	Highway	2	1	3	1.95	3	1	2	3	3	1.65
Forrester Road	IC	I-8	SR 78	FORRESTER ROAD FROM I-8 TO SR-78. WIDEN AND IMPROVE TO FOUR-LANE STATE HIGHWAY. PHASE 1 OPERATIONAL IMPROVEMENTS. PHASE 2 TO INCLUDE A FOUR (4) LANE ROAD WIDENING AND WESTMORLAND BYPASS. Expansion	Highway	1	2	3	1.95	3	1	2	3	3	1.65
SR 115	IC	I-8/SR 7 Interchange	Evan Hewes Highway/SR 115 Junction	Construct 4-lane expressway (Proposed new road included in the long range transportation plan)	Highway	1	2	3	1.95	3	1	2	3	3	1.65
I-5	SD	SR 54	SR 15	Dedicated truck lanes on freeways with high truck volumes: expansion	Highway	1	2	3	1.95	3	1	2	2	3	1.5
I-5	SD	SR 94	I-8	San Diego International Airport: Airport (wireless) charging for ZE on-airport trucks/support vehicles/baggage carts/belt loaders	Air cargo	3	1	1	1.7	1	3	2	2	1	2.5
Harbor Drive	SD	Civic Center Drive	32nd Street	Vesta Bridge Phase 1 and operational improvements SR-15, Main, Harbor, and 32nd Streets	Grade separations, ITS	2	2	1	1.7	2	3	2	3	2	2.4
SR 111	IC	SR 78	County Line	Truck route development and geofencing around disadvantaged communities: Calipatria	Highway, ITS	1	3	1	1.7	1	2	2	1	3	2.3
SR 86	IC	I-8	SR 78 S	Truck route development and geofencing around disadvantaged communities: Brawley	Highway, ITS	1	3	1	1.7	1	2	2	1	3	2.3
SR 98	IC	I-8 W	SR 111	SR-98 FROM OLLIE AVENUE TO ROCKWOOD DRIVE. IN CALEXICO - WIDEN CONVENTIONAL HIGHWAY PHASE 1A - FROM 32.4 TO 32.6 WIDEN FROM 4 TO 6 LANES	Highway	1	1	3	1.6	1	1	2	3	3	2.35
SR 98	IC	I-8 W	SR 111	SR-98 FROM DOGWOOD ROAD TO ALL AMERICAN CANAL. PHASE 2 - FROM 30.0 TO 30.9 WIDEN FROM 2 TO 4 LANES	Highway	1	1	3	1.6	2	1	2	3	3	2
SR 98	IC	I-8 W	SR 111	SR-98 FROM ALL AMERICAN CANAL TO VV WILLIAMS AVENUE. PHASE 1C - FROM 30.9 TO 32.2 WIDEN FROM 2 TO 4 LANES	Highway	1	1	3	1.6	2	1	2	3	3	2
SR 98	IC	SR 111	SR 7	SR-98 FROM SR-111 TO SR-7. WIDEN AND IMPROVE TO 4/6 LANES. ON EITHER JASPER ROAD OR SR-98	Highway	1	1	3	1.6	2	1	2	3	3	2
I-8	SD	Greenfield Dr	Forrester Rd	Jacumba/Jacume new commercial vehicle POE	POE	1	1	3	1.6	3	1	3	3	3	1.8

Corridor	County	Start	End	Project Description	Project Type	Scoring of Benefits				Scoring of Feasibility					
						Environment	Equity	Economy	Benefits Weighted	Cost	Funding	S. Support	Tech Complexity	Planning Cont.	Opportunities/ Feasibility Weighted
SR 111	IC	SR 98	I-8	WIDEN AND IMPROVE TO 6 LANE FREEWAY WITH INTERCHANGES AT HEBER, MCCABE, AND JASPER AND OVERPASS AT CHICK RD.	Highway	1	1	3	1.6	3	1	2	3	3	1.65
I-805	SD	Mesa College Drive	Balboa Avenue	Managed Lanes: expansion	Highway	1	1	2	1.3	2	2	2	3	3	2.25
I-15	SD	I-8	SR 163	Managed Lanes: expansion	Highway	1	1	2	1.3	3	2	2	3	3	1.9
I-15	SD	Valley Parkway	SR 76	Managed Lanes: expansion	Highway	1	1	2	1.3	3	2	2	3	3	1.9
I-15	SD	SR 76	County Line	Managed Lanes: expansion	Highway	1	1	2	1.3	3	2	2	3	3	1.9
I-5	SD	SR 54	SR 15	Managed Lanes on freeways with high truck volumes: expansion	Highway	1	1	2	1.3	3	2	2	3	3	1.9
I-5	SD	I-8	I-805 North	Managed Lanes: expansion	Highway	1	1	2	1.3	3	2	2	3	3	1.9
I-805	SD	I-15	I-8	Managed Lanes: expansion	Highway	1	1	2	1.3	3	2	2	3	3	1.9
SR 15	SD	I-5	I-805	Managed Lanes: expansion	Highway	1	1	2	1.3	3	2	2	3	3	1.9

Policies	Scoring of Benefits				Scoring of Feasibility						
	Environ-ment	Equity	Economy	Benefits Weighted	Cost	Funding	S. Support	Tech Complexity	Planning Cont.	Opportunities/ Feasibility Weighted	
Toll discounts for ZE trucks	3	3	2	2.7	2	2	3	2	2	2.15	
Overweight Truck Route Planning: Study the potential for increasing weight limits for battery electric medium- and heavy-duty vehicles on on Clean Freight Corridors and other truck routes, and policy support for necessary legislative changes	3	2	3	2.65	1	2	2	2	2	2.35	
Low-emission zones in AB 617 or other disadvantaged communities	3	3	1	2.4	1	2	2	2	2	2.35	
Develop recommendations on land use compatibility for truck parking/warehouses/ industrial uses, increasing buffer zones near residential, schools, other sensitive uses. Recommend maintaining/ adding truck parking/industrial land use availability in appropriate areas	2	3	2	2.35	1	2	2	2	1	2.25	
Develop recommendations for inland ports in Imperial County with zero-emissions vehicles and rail connections	2	2	3	2.3	1	2	2	2	1	2.25	
Address Caltrans truck route network for STAA/CA legal and fill in gaps	2	1	3	1.95	3	2	2	3	3	1.9	
Climate adaptation projects across region-study and prioritize most vulnerable freight facilities	1	1	2	1.3	1	2	2	2	1	2.25	
Update development impact fees to consider future intensive land use, such as mining/extraction, and required freight transportation infrastructure/roads/bridges	1	1	1	1	1	2	2	3	1	2.4	

Programs	Scoring of Benefits				Scoring of Feasibility					Opportunities/ Feasibility Weighted
	Environment	Equity	Economy	Benefits Weighted	Cost	Funding	S. Support	Tech Complexity	Planning Cont.	
NextGen 511 Concept of Operations Traveler Information System	3	3	3	3	2	2	3	3	3	2.4
Zero-emission truck incentive program	3	3	3	3	3	1	3	2	2	1.55
Pilot creation of cargo bike delivery areas through bike project implementation	3	3	2	2.7	1	2	3	3	2	2.65
Provide incentives for businesses to purchase cargo bikes	3	3	2	2.7	1	1	3	3	2	2.4
New or rebuilt switcher locomotives to hybrid, near-zero, or zero-emission technologies for BNSF	3	3	2	2.7	3	3	2	2	2	1.9
New or rebuilt switcher locomotives to hybrid, near-zero, or zero-emission technologies for UPRR	3	3	2	2.7	3	3	2	2	2	1.9
New or rebuilt switcher locomotives to hybrid, near-zero, or zero-emission technologies for SDIY	3	3	2	2.7	3	3	2	2	2	1.9
Support for private truck parking site development/ZE charging through grant support and establishment of public-private partnerships	3	2	3	2.65	2	3	3	2	3	2.5
Pilot delivery lockers in Mobility Hubs	3	2	2	2.35	1	2	3	3	2	2.65
Pilot delivery robots in Mobility Hubs	3	2	2	2.35	1	1	3	3	2	2.4
Dynamic curb regulations	2	2	3	2.3	2	1	3	2	2	1.9
Truck platooning/Connected and Autonomous pilots on SR 905	2	2	3	2.3	1	1	1	1	1	1.7
Truck Parking Information Management System: regionwide resource for port tenants and truck operators to obtain information about availability and potentially reserve parking resources, including emergency/seasonal locations; could be tied to Port Freight Community Web Portal and integrated with regional ITS systems	2	2	2	2	1	1	3	3	3	2.5
Smart Intersection Systems	2	2	2	2	3	3	2	3	3	2.15
Pilot urban consolidation center operations in Mobility Hubs	2	2	2	2	2	2	2	2	1	1.9
Active Transportation and Demand Management	2	2	2	2	3	2	2	2	3	1.75
Advanced Train Detection Systems for at-grade crossings	2	1	2	1.65	3	3	2	2	2	1.9
Regional Advanced Air Mobility deployment	1	1	1	1	3	\$1	2	1	1	1.15

Appendix H:

Summary Fact Sheets for Key Strategies



SAN DIEGO AND IMPERIAL COUNTIES SUSTAINABLE FREIGHT IMPLEMENTATION STRATEGY

SUMMARY FACT SHEETS FOR KEY STRATEGIES

December 2023

The enclosed fact sheets summarize 11 key projects, programs, and policies recommended by the San Diego and Imperial Counties Sustainable Freight Implementation Strategy. They cover a broad range of potential improvements to the regional freight system, including multimodal infrastructure, the adoption of new technology, and incentives to reduce impacts and improve efficiency. The highlighted projects are representative examples of improvements recommended in several locations across the study area. The entire project list and evaluation results are available in the Final Benefits and Feasibility Scoring Memorandum.

PROJECT FACT SHEET

ZERO-EMISSION TRUCK CHARGING AND PARKING/ STAGING AREA: OTAY MESA PORT OF ENTRY

Adding zero-emission (ZE) truck charging and parking/staging facilities in strategic locations across the region, including around the Otay Mesa Port of Entry, will help modernize our goods movement system and create equitable benefits for the environment, our communities, and the economy.

Benefits

- ZE charging provides cleaner power than diesel fuel to trucks and further incentivizes the adoption of ZE technology, reducing the emission of greenhouse gases and air pollutants, such as diesel particulate matter.
- New truck parking/staging areas serve a major unmet need by providing resting and waiting areas for truck drivers. Locating these facilities in industrial areas avoids attracting additional truck traffic toward the most vulnerable communities.



While the Otay Mesa Port of Entry area is a top candidate for this type of facility, the *San Diego and Imperial Counties Sustainable Freight Implementation Strategy* recommends that similar facilities be constructed strategically to support a regionwide network. To maximize benefits, this strategy should be deployed near all U.S./Mexico land ports of entry, near the Port of San Diego marine terminals, and along major goods movement corridors, including Interstates 5, 8, and 15 (I-5, I-8, and I-15), and State Routes 11, 78, 86, 111, and 905 (SR 11, SR 78, SR 86, SR 111, and SR 905).

ESTIMATED COST & FUNDING

The estimated project cost is approximately \$5 to \$9 million, including design, construction, and permitting. The cost of ZE truck charging stations will vary depending on the number of chargers, the power level for the chargers, the power available at the site, and any service upgrades needed. This estimate

The ***San Diego and Imperial Counties Sustainable Freight Implementation Strategy*** is reviewing and evaluating a wide range of projects, programs, policies, and workplace development strategies to help improve San Diego's regional goods movement system. For more details, please visit: <https://www.sandag.org/projects-and-programs/goods-movement-planning/>.

does not include right-of-way acquisition and assumes a charging station facility consisting of four chargers at either 150 kilowatts or 350 kilowatts depending on the location of the chargers and the duty cycle/requirements of the vehicles. The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- California SBI: Trade Corridor Enhancement Program
- Innovative Charging Solutions for Medium- and Heavy-duty Electric Vehicles
- Rebuilding American Infrastructure with Sustainability and Equity
- California Energy Commission: Charging and Refueling Infrastructure for Transport in California Provided Along Targeted Highway Segments (CRITICAL PATHS)
- Federal Highway Administration (FHWA): Charging and Fueling Infrastructure Discretionary Grant Program (CFI Program)
- Environmental Protection Agency: Clean Ports Program

SAMPLE DEVELOPMENT SCHEDULE

The project will require three to five years for full implementation, including all required planning, design, permitting, and construction. The sample schedule below summarizes the major milestones in the project development process. For projects where power network updates are required, the implementation time will increase depending on the degree of upgrades needed.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Preliminary Design	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and design activities
<i>Caltrans Project Study Report (PSR) or similar Conceptual Planning Study</i>	12-18 months following identification of project funding
<i>Preliminary Design</i>	12-18 months following the conceptual planning study
Environmental & Regulatory Review	
<i>CEQA/NEPA Review</i>	12-18 months, concurrent with preliminary design activities. NEPA required for federal funding/facilities
<i>Regulatory Approval of Draft Design, including Federal CBP/GSA, Caltrans, City of San Diego, Energy Utilities</i>	12-18 months, concurrent with preliminary design activities. Includes maintenance and liability agreements
Final Design	6-12 months following all planning, preliminary design, environmental and regulatory reviews
Permit Issuance	3-6 months following final design
Construction	12-24 months following permit issuance

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

In the planning of this project, it is essential to consider the incorporation of complementary satellite initiatives that can complement the core strategy, such as truck parking management systems and port of entry appointment systems. Additional strategies could be implemented focused on technology interfaces to communicate the availability of truck charging stations and parking spaces, notifying Customs and Border Protection of truck locations in advance of border crossing appointments. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of project implementation include:

- Initial capital cost
- Technical complexities of ZE power supply and integration, including upgrades to utility infrastructure to support vehicle charging
- Requirements for multi-stakeholder coordination, including federal agencies and energy utilities
- Identifying a viable model for ongoing operations and maintenance responsibilities in coordination with public agencies and potential private sector partners

The project's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities of planning and design. This includes special focus with local utilities to ensure the project site has sufficient power generation and/or delivery capacity.

PROJECT FACT SHEET

TRUCK REST AREA PARKING, AMENITIES, & ZERO-EMISSION CHARGING: SUNBEAM REST AREA

Revitalizing regional rest areas and adding amenities and ZE truck charging and parking facilities in strategic locations across the region, including the Sunbeam rest area, will help modernize our goods movement system and create benefits for the environment, safety, equity, and the economy.



Benefits

- ZE charging provides cleaner power than diesel fuel to trucks. Further, it incentivizes the adoption of ZE technology, reducing the emission of greenhouse gases and air pollutants, such as diesel particulate matter.
- Truck parking areas serve a major need by providing resting areas for truck drivers. Locating these facilities in existing rest areas avoids attracting additional truck traffic toward the most vulnerable communities.
- New rest area amenities provide valuable health, safety, and wellbeing benefits to the freight vehicle operators that can improve safety, productivity, and enhance network efficiency.

While the Sunbeam rest area is a top candidate for this type of facility, the *San Diego and Imperial Counties Sustainable Freight Implementation Strategy* recommends that similar facilities be constructed strategically to support a regionwide network. To maximize benefits, this strategy should be deployed at existing rest areas that could feasibly accommodate ZE charging infrastructure, especially those located along major goods movement corridors, including I-5, I-8, and I-15, and SR 11, SR 78, SR 86, SR 111, and SR 905.

The ***San Diego and Imperial Counties Sustainable Freight Implementation Strategy*** is reviewing and evaluating a wide range of projects, programs, policies, and workplace development strategies to help improve San Diego's regional goods movement system. For more details, please visit: <https://www.sandag.org/projects-and-programs/goods-movement-planning/>

ESTIMATED COST & FUNDING

The estimated project cost is approximately \$5 to \$15 million, including design, construction, and permitting. The cost of ZE truck charging stations will vary depending on the number of chargers, the power level for the chargers, the power available at the site, and any service upgrades

needed.-This estimate does not include right-of-way acquisition. The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Department of Energy: Low Greenhouse Gas Vehicle Technologies
- EPA: Clean Heavy-duty Vehicle Program
- FHWA: CFI Program

SAMPLE DEVELOPMENT SCHEDULE

The project will require three to five years for full implementation, including all the necessary planning, design, permitting, and construction. The sample schedule below summarizes the major milestones in the project development process. For projects requiring power network updates, the implementation time will increase depending on the degree of upgrades needed.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Preliminary Design	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and design activities
<i>Caltrans Project Study Report (PSR) or similar Conceptual Planning Study</i>	12-18 months following identification of project funding
<i>Preliminary Design and Caltrans Project Report, Design Engineering Evaluation Report, or similar Preliminary Engineering and Project Approval document</i>	12-18 months following the conceptual planning study
Environmental & Regulatory Review	
<i>CEQA/NEPA Review and Document</i>	12-18 months, concurrent with preliminary design activities. NEPA required for federal funding/facilities
<i>Regulatory Approval of Draft Design, including Federal FHWA, Caltrans, City of San Diego, Imperial County, Energy Utilities</i>	12-18 months, concurrent with preliminary design activities. Includes maintenance and liability agreements
Final Design	9-18 months following all planning, preliminary design, environmental and regulatory reviews
Permit Issuance	3-6 months following final design
Construction	12-24 months following permit issuance

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

In the planning of this project, it is essential to consider incorporating complementary satellite initiatives that can complement the core strategy, such as advance signage and outreach to inform drivers of available charging infrastructure and amenities, and deceleration and acceleration lanes to and from the rest area to enhance safe merge and diverge movements on the highway. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of project implementation include:

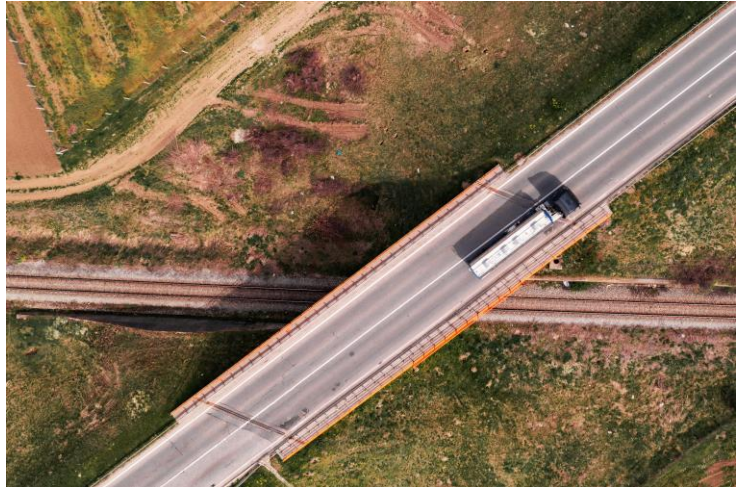
- Initial capital cost
- Technical complexities of ZE power supply and integration
- Identifying anticipated usage of the site to determine if additional paving and parking is needed
- Requirements for multi-stakeholder coordination, including federal agencies, California Department of Transportation (Caltrans), local service providers, such as for janitorial services, and energy utilities
- Identifying a viable model for ongoing operations and maintenance responsibilities in coordination with public agencies and potential private sector partners

The project's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities of planning and design. This includes special focus with local utilities to ensure the project site has sufficient power generation and/or delivery capacity.

PROJECT FACT SHEET

RAILROAD-ROADWAY GRADE SEPARATION: STATE ROUTE 98 IN CALEXICO

The strategic implementation of railroad-roadway grade separations in critical freight locations across the region, including at the SR 98 intersection in Calexico, will help modernize and advance the efficiency of our goods movement system and create benefits for the environment, safety, equity, and economy.



Benefits

- Improves traffic flow and reduces congestion near the railroad-roadway intersection, which will increase transportation efficiency.
- Reduces and mitigates the environmental impacts of railroad and roadway transportation modes through a reduction of emissions.
- Enhances the safety for all railroad and roadway users by preventing any potential collisions.
- Contributes to a higher quality of life for nearby residents through a reduction in noise and traffic pollution.
- Improves efficiency of goods movement and supports the economy, in areas of high truck traffic.

While the SR 98 railroad-roadway intersection is a top candidate for this type of facility, the *San Diego and Imperial Counties Sustainable Freight Implementation Strategy* recommends that similar facilities be constructed strategically to support a regionwide network. To maximize benefits, this strategy should be deployed at all railroad-roadway intersections along and adjacent to major goods movement corridors, including I-5, I-8, and I-15, and SR 11, SR 78, SR 86, SR 111, and SR 905.

The ***San Diego and Imperial Counties Sustainable Freight Implementation Strategy*** is reviewing and evaluating a wide range of projects, programs, policies, and workplace development strategies to help improve San Diego's regional goods movement system. For more details, please visit: <https://www.sandag.org/projects-and-programs/goods-movement-planning/>.

ESTIMATED COST & FUNDING

The estimated project cost is approximately \$150 to \$200 million, including design, construction, and permitting.

The cost for railroad-roadway grade separations will vary depending on the roadway size and alignment, number of tracks, topography, and any service or safety upgrades needed. This estimate

does not include right-of-way acquisition. The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Federal Railroad Administration (FRA): Consolidated Rail Infrastructure and Safety Improvements
- Section 190 Grade Separation Program
- FRA: Railroad Crossing Elimination Program

SAMPLE DEVELOPMENT SCHEDULE

The project will require 7 to 10 years for full implementation, including all required planning, design, permitting, and construction. The sample schedule below summarizes the major milestones in the project development process. Rail grade crossing project will require coordination with the railroad throughout design and construction, which is reflected in the durations, below, and further detailed in implementation considerations section.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Preliminary Design	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and design activities
<i>Caltrans Project Study Report PSR or similar Conceptual Planning Study</i>	12-18 months following identification of project funding
<i>Preliminary Design and Caltrans Project Report or similar Preliminary Engineering and Project Approval document</i>	18-24 months following the conceptual planning study, including time to enter into a review agreement with Union Pacific Railroad (UPRR) and review of 30% design
Environmental & Regulatory Review	
<i>CEQA/NEPA Review and Document</i>	24-30 months, concurrent with preliminary design activities. NEPA required for federal funding/facilities
<i>Regulatory Approval of Draft Design, including Federal FRA, Caltrans, City of San Diego, California Public Utilities Commission</i>	12-18 months, concurrent with preliminary design activities. Includes maintenance and liability agreements
Final Design	18-24 months following all planning, preliminary design, environmental and regulatory reviews, including 2-3 months for UPRR review after each of 60, 90, and 100% design and entry into a construction and maintenance agreement after 100% design plans are approved
Permit Issuance	6-9 months following final design
Construction	18-36 months following permit issuance, depending on construction windows allowed by railroad

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

In the planning of this project, it is essential to consider the incorporation of complementary satellite initiatives that can complement the core strategy, such as corridor plans with a significant focus on freight, clean freight corridors, truck only lanes, and freight signal prioritization. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of project implementation include:

- Initial capital cost
- Technical complexities of engineering design and construction, including achieving consensus on the grade separation alignment
- Impacts to adjacent properties and local roads, particularly with a roadway realignment strategy
- Long lead-time coordination for permanent and temporary utility relocations (e.g., overhead electrical lines)
- Potential disruptions of railroad and roadway traffic and/or complex construction staging and temporary facilities to minimize disruptions
- Potential increase to the project environmental study and impact area due to temporary facilities (e.g., temporary track or roadway alignment)
- Requirements for multi-stakeholder coordination, including federal agencies, Caltrans, energy utilities, and particularly railroads. In this case, the highway crosses the UPRR. Coordination with UPRR should start at conceptual design.
- Complementary features may be added to the scope of the project, which increase roadway capacity on State Route 98, such as a new dedicated truck-only lane or additional general-purpose capacity. If so, early coordination with Caltrans is needed to determine if the improvements can be exempted from the State of California CEQA requirements for analyzing and mitigating Vehicle Miles Traveled. If not exempted, these improvements may need to be phased to avoid delays to the grade separation improvements
- The identification of a viable model for ongoing operations and maintenance responsibilities in coordination with public agencies and potential private sector partners

The project's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help guide all parties through the complexities of planning and design.

PROJECT FACT SHEET

WIRELESS INDUCTIVE CHARGING FOR TRUCKS IN QUEUE: OTAY MESA EAST PORT OF ENTRY

Adding wireless inductive or in-road charging for trucks in queue at locations across the region, including at the Otay Mesa Port East of Entry, will help modernize the goods movement system and create benefits for the environment, equity, and the economy.

Benefits

- Wireless inductive charging improves operational efficiency by reducing the total time electric vehicles need to stop at charging locations, offers potential economic savings, and enhances the reliability of electric fleet vehicles.
- Wireless inductive charging has the potential to provide benefits beyond standard electric charging (reduction in emissions, noise pollution, reliance on traditional fueling methods) such as extended range, reduced battery size, adaptability to traffic conditions, and ease of use. Locating these facilities in industrial areas and along already highly congested roadways avoids attracting additional truck traffic toward the most vulnerable communities.



While the Otay Mesa Port of Entry area is a top candidate for this type of facility, the *San Diego and Imperial Counties Sustainable Freight Implementation Strategy* recommends that similar facilities be constructed strategically in areas of high truck traffic. To maximize benefits, this strategy should be deployed near all U.S./Mexico land ports of entry and near the Port of San Diego marine terminals.

ESTIMATED COST & FUNDING

The estimated project cost is approximately \$5 to \$9 million, including design, construction, and permitting. The cost of wireless inductive charging facilities will vary depending on the number of chargers, the power level for the chargers, the power grid capacity, and any service upgrades needed. This estimate does not include right-of-way acquisition and assumes a charging station facility consisting of four 250-kilowatt chargers. The project team evaluated potential

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funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Advanced Vehicle Technologies
- Vehicle Technologies Office
- Advanced Technology Demonstration and Pilot Projects
- FHWA: Advanced Transportation Technologies and Innovative Mobility Deployment
- FHWA: Strengthening Mobility and Revolutionizing Transportation Grants Program
- FHWA: Charging and Fueling Infrastructure Program
- Maritime Administration: Port Infrastructure Development Program

SAMPLE DEVELOPMENT SCHEDULE

The project will require three to five years for full implementation, including all required planning, design, permitting, and construction. The sample schedule below summarizes the major milestones in the project development process. For projects where power network updates are required, the implementation time will increase depending on the degree of upgrades needed.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Preliminary Design	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and design activities
<i>Caltrans Project Study Report (PSR) or similar Conceptual Planning Study</i>	12-18 months following identification of project funding
<i>Preliminary Design</i>	12-18 months following the conceptual planning study
Environmental & Regulatory Review	
<i>CEQA/NEPA Review</i>	12-18 months, concurrent with preliminary design activities. NEPA required for federal funding/facilities
<i>Regulatory Approval of Draft Design, including Federal CBP/GSA, Caltrans, City of San Diego, Energy Utilities</i>	12-18 months, concurrent with preliminary design activities. Includes maintenance and liability agreements
Final Design	6-12 months following all planning, preliminary design, environmental and regulatory reviews
Permit Issuance	6-12 months following final design
Construction	12-24 months following permit issuance

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

In the planning of this project, it is essential to consider the incorporation of complementary satellite initiatives that can complement the core strategy, such as reservation systems, truck parking, truck-only lanes, and freight signal prioritization. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of project implementation include:

- Initial capital cost
- Technical complexities of wireless inductive power supply and integration, as well as standardization and compatibility issues
- Requirements for multi-stakeholder coordination, including federal agencies and energy utility providers
- Identifying a viable model for ongoing operations and maintenance responsibilities in coordination with public agencies and potential private sector partners

The project's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities of planning and design. This includes special focus with local utilities to ensure the project site has sufficient power-generation and/or delivery capacity.

PROJECT FACT SHEET

TRUCK-ONLY LANES: I-5 & SR 905 BETWEEN PORT OF SAN DIEGO & OTAY MESA EAST PORT OF ENTRY

Incorporating truck-only lanes in strategic locations across the region, including on I-5 and SR 905 between the port of San Diego and Otay Mesa East Port of Entry, will benefit freight operations and advance the efficiency of our goods movement system and create benefits for the environment, safety, equity, and economy.



Benefits

- Designated truck-only lanes can enhance freight network efficiency and safety by separating heavy cargo from regular passenger vehicles, helping to alleviate congestion, and improve traffic flow, facilitating a better supply chain by decreasing the total time to deliver goods.
- Reduced wear and tear on general-purpose lane roadway infrastructure by concentrating stress and strain to specific areas, leading to cost savings and roadway longevity.
- Enhanced safety for roadway users by minimizing weaving movements between trucks and passenger vehicles, reducing the potential for conflicts.
- Reduced emissions and fuel consumption through streamlined freight movement and a reduction stop-and-go travel.

ESTIMATED COST & FUNDING

The estimated project cost is approximately \$80 to \$100 million, including design, construction, and permitting. The cost for truck-only lanes will vary depending on the total length of the lane, topography, specific infrastructure requirements, and any service upgrades needed. This estimate does not include right-of-way acquisition. While these lanes are anticipated to be conversions of existing general-purpose lanes, some right-of-way additions may be needed to accommodate safe merging and transitions. The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

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- California SBI: Solutions for Congested Corridors
- FHWA: Local Highway Safety Improvement Program
- California SBI: Trade Corridor Enhancement Program
- FHWA: Multimodal Project Discretionary Grant Program

SAMPLE DEVELOPMENT SCHEDULE

The project will require 5 to 10 years for full implementation, including all required planning, design, permitting, and construction. The sample schedule below summarizes the major milestones in the project development process. For projects where power network updates are required, the implementation time will increase depending on the degree of upgrades needed.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Preliminary Design	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and design activities
<i>Caltrans Project Study Report (PSR) or similar Conceptual Planning Study</i>	12-18 months following identification of project funding
<i>Preliminary Design and Caltrans Project Report or similar Preliminary Engineering and Project Approval document</i>	18-24 months following the conceptual planning study
Environmental & Regulatory Review	
<i>CEQA/NEPA Review and Document</i>	36+ months, concurrent with preliminary design activities. NEPA required for federal funding/facilities
<i>Regulatory Approval of Draft Design Including Federal CBP/GSA, Caltrans, City of San Diego, Energy Utilities</i>	36+ months, concurrent with preliminary design activities. Includes maintenance and liability agreements
Final Design	24-30 months following all planning, preliminary design, environmental and regulatory reviews
Right-of-Way & Utilities	12-24 months
Permit Issuance	3-6 months following final design
Construction	12-36 months following permit issuance

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

In the planning of this project, it is essential to consider the incorporation of complementary satellite initiatives that can complement the core strategy, such as Port of Entry efforts that address freight movement, such as truck information and reservation systems, truck-only lanes, clean freight corridors, and truck parking projects. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of project implementation include:

- Caltrans requires Vehicle Miles Traveled (VMT) analysis and mitigation for any capacity-enhancing projects on state facilities. A Statement of Overriding Considerations would require approval through the Caltrans Director to allow public circulation of a draft environmental document that includes alternatives that do not fully mitigate for added VMT. Although the truck-only lanes are proposed to be conversions of existing general-purpose lanes, the project is still expected to complete the VMT analysis, as well as a freeway operations analysis, to evaluate the resulting impacts to operations from the lane conversion. If the freeway operations are projected to fail or cause significant impacts, those will be considered carefully in the context of other regional improvements planned to alleviate congestion or minimize VMT, and the project might have difficulty obtaining approval to move forward
- Public comment period during circulation of the environmental document may be challenging due to the proposal to convert existing lanes to truck-only lanes
- Initial capital cost
- Technical complexities of engineering design and construction, including identifying logical begin and end points of truck-only lanes, providing truck passing lanes if determined to be needed, safely accommodating interchange entrance and exit ramp movements, developing advanced signage to safely transition passenger vehicles and trucks into and out of their dedicated lanes, and transitioning to port of entry infrastructure and technology
- Right-of-way acquisition and potential disruptions of roadway traffic
- Long-term enforcement of truck-only lanes to prevent passenger vehicles from impeding truck traffic throughput and safe maneuverability
- Requirements for multi-stakeholder coordination, including federal agencies, Caltrans, local agencies, and energy utilities

The project's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities of planning and design.

PROGRAM FACT SHEET

INCENTIVES FOR BUSINESSES TO PURCHASE CARGO BIKES

Encouraging businesses to adopt eco-friendly cargo bikes for delivery and transportation needs can provide many benefits to urban and high-density areas. A study to explore incentives and address regulatory barriers for using cargo and electric cargo bikes in denser urban areas for the first-/last-mile delivery, as well as supportive infrastructure, can advance the sustainability and efficiency of delivery and transportation services and promote local development.



Benefits

- Mitigate freight network effects on the environment by reducing the emission of greenhouse gases and air pollutants, such as diesel particulate matter. It is estimated that a single cargo bike can save 13 tons of CO2 emissions per year.
- Alleviate urban traffic congestion. Cargo bikes can offer increased route flexibility compared to large delivery trucks by using vehicle and bicycle infrastructure.
- Decrease operating costs for businesses.

The study for this program will address elements required for implementation, including incentives, infrastructure needs, emissions and congestion evaluation, program guidelines, and local stakeholder outreach to encourage program adoption.

ESTIMATED COST & FUNDING

The cost for a regional study to implement incentives for businesses to purchase cargo bikes is estimated to be between \$300,00 to \$400,000 and will vary depending on the size of the study and types of incentives considered (Transportation Demand Management Plan, providing loading/curb space, curb management tools, on-street charging, and secured parking etc.). Similar pilots include:

- Boston Transportation Department: 18-month program subsidizing delivery costs for eight businesses and providing e-bikes for \$345,000

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- Colorado Energy Office: solicitating proposals to develop and implement eCargo bike deployment projects that replace commercial delivery vehicles for \$240,000

The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Caltrans: Active Transportation Program
- FHWA: Active Transportation Infrastructure Investment Program
- FHWA: Carbon Reduction Program

SAMPLE DEVELOPMENT SCHEDULE

The study will require two to three years for full implementation, including all required procurement, planning, and stakeholder coordination. The sample schedule below summarizes the major milestones in the planning process.

Milestone	Estimated Schedule
Identification of Study Funding	Ongoing
Study Development	
<i>Define program guidelines (Vehicle Specifications, Safe operation, Data Sharing, Loading/Unloading, Education and Enforcement)</i>	3-6 months
<i>Community & Stakeholder Outreach</i>	Ongoing throughout study activities
<i>Caltrans Project Study Report (PSR) or Pilot Program Recommendations</i>	12-18 months following identification of project funding and procurement
<i>Evaluation Report/Findings</i>	6-12 months following pilot program implementation
Environmental & Regulatory Review	
<i>CEQA/NEPA Review</i>	Exempt

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

To move forward and implement recommendations from the study, it is essential to consider incorporating satellite initiatives to complement the core strategy, such as the expansion of bike-ped infrastructure and low-emission zone policies.

Considerations for the implementation of a cargo bike program include:

- Working with the private sector to identify barriers to the wider adoption of cargo bikes and work to lower infrastructure or regulatory barriers
- Working with the private sector to disseminate information on cargo bikes and establish peer knowledge exchanges

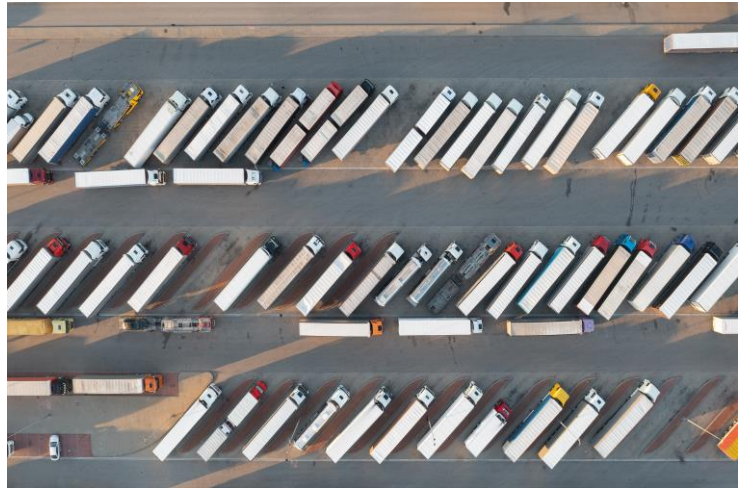
The potential challenges of program implementation include:

- Initial capital cost of acquiring cargo bikes and necessary infrastructure for storage, charging, cargo bike parking, maintenance
- Business hesitation and concerns about delivery efficiency and capacity limitations
- Legal context and local regulations for cargo bikes
- Program monitoring and reporting
- Staff time to manage cargo bike pilot and operator permit program for businesses
- Potential policy hurdles. For example, updating e-bike definition to adjust maximum width limits and needing to create “Cargo Bike Loading Only” curb regulation

PROGRAM FACT SHEET

SUPPORT FOR PRIVATE TRUCK PARKING SITE DEVELOPMENT

The development of additional truck parking facilities is an essential aspect of the framework that improves overall freight network efficiency. Designated truck parking sites help to facilitate the electrification of truck fleets, improve fluidity and operations, reduce impacts from vulnerable communities, and increase economic competitiveness and opportunities. More parking locations would also reduce driver fatigue and provide drivers with a place to wait in advance of completing their trip.



Private truck parking facilities provide 92 percent of all parking spaces in the state of California. While the private sector will continue to play an integral role in developing parking facilities, there are actions the public sector can take to facilitate and leverage more private investment. Building on initial studies carried out by Caltrans 2022 California Statewide Truck Parking Study (including the Appendix F: Public-Private Partnership Action Plan: Partnership Screening Tool and Scenario Analysis) and Washington State Department of Transportation 2021 Washington State Truck Parking Action Plan, a regional program would consist of a study to look at opportunities for encouraging private truck parking site development. A few potential private partnership incentive ideas that can be considered under this program include:

- Potential commercial tax incentives and/or permitting and zoning incentives for property owners to provide truck parking
- Agreement and tax incentive structures with businesses and facilities that have large existing parking facilities used only on a periodic or seasonal basis, such as a stadium, to be used for truck parking when not in use for its intended purposes
- Collaboration with private developers and investors of electric vehicle charging facilities and private truck parking facilities
- Usage of federal and other state grants to expand truck parking as a way to partner and incentivize with private investors and developers
- Usage and promotion of mobile applications to allow property owners to market their available space and truck drivers and companies to identify, reserve, and pay for parking at available locations, expanding the pool of inventory and providing a financial incentive for participating property owners

Benefits

- A decrease in unauthorized truck parking in non-designated areas can provide benefits to vulnerable communities near industrial areas. When parked in designated parking sites, trucks do not have to idle, thus reducing emissions.
- Truck parking sites provide enhanced driver health through on-site amenities and driver safety by removing on-street parking incidents.
- Developed and modernized truck parking sites offer a base to apply EV and ZE technology.
- An improvement in freight network facilities has the potential to attract additional economic and financial opportunities.

Recent studies in California and numerous states around the country, as well as the FHWA Truck Parking Development describe the difficulties that truck drivers have finding parking, particularly in and near urban areas. This program is aimed at addressing the critical need for secure and accessible parking facilities for these freight drivers. Under this program, a study would be conducted to provide insight into the demand, logistics, incentives, and regulatory factors that can determine best practices to support the development of truck parking sites and in turn, improve the efficiency of the freight network.

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ESTIMATED COST & FUNDING

The cost for this study is estimated to be between \$400,000 to \$600,000.

The project team evaluated potential funding opportunities and identified discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- FHWA: CFI Program

SAMPLE DEVELOPMENT SCHEDULE

The study will require two to three years for completion, including all required data gathering, analysis, planning, and stakeholder engagement. The sample schedule below summarizes the major milestones in the program development process.

Milestone	Estimated Schedule
Identification of Plan Funding	Ongoing
Planning and Policy Study	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning activities
<i>Data Gathering and Analysis</i>	6-8 months following identification of study funding
<i>Technical Study and Recommendations</i>	18-24 months following data gathering and analysis
Program Development	6-12 months following completion of the study, including jurisdictional reviews and approvals.
Environmental & Regulatory Review	
<i>CEQA/NEPA Review</i>	Exempt

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

In the planning of this project, it is essential to consider the incorporation of complementary initiatives that can supplement the core strategy, such as electric vehicle truck corridors and truck-only lanes. These additional strategies would provide compound benefits to the freight network and have multiplier effects for sustainability benefits.

The potential challenges of program implementation include:

- Identifying appropriate funding sources and obtaining approvals for incentives that will fund development on private sites
- Obtaining the necessary data from private companies to understand current parking dynamics
- Obtaining local jurisdictional support for a program that sites truck parking facilities
- Addressing regulatory and zoning requirements, such as maintaining long-term viability and safety
- Coordinating efforts among private entities, government agencies, and logistics companies

The program's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies to help lead all parties through the complexities of planning and design. Key stakeholders include local jurisdictions, private trucking companies, and parking operators.

PROGRAM FACT SHEET

DYNAMIC CURB REGULATION

Analyzing curb space management practices through dynamic or real-time management systems in urban areas can help to alleviate issues along heavily congested corridors. This approach uses technology and data to dynamically allocate curb space for various purposes based on current needs and demand.

Benefits

- Optimized parking: Dynamic curb regulation allows for real-time monitoring and adjustment of parking and freight loading availability.
- Increased accessibility to delivery points and improved freight movement efficiency.
- Reduced traffic congestion: Efficient curb management can enhance curb space utilization and reduce overall congestion by preventing unnecessary circling for parking. When drivers have real-time information about parking and loading availability, they can more quickly make deliveries and avoid double parking.
- Streamlined truck operations can minimize environmental impacts by reducing emissions during first- and last-mile deliveries.



A study on dynamic curb regulation should identify congested, dense urban locations for a pilot program. The study should seek pilot locations and analyze the potential impacts of dynamic curb regulation on increased revenue generation, enhanced accessibility, improved freight and delivery operations, reduced traffic congestion, flexible use of curb space, and using data to make decisions.

In the planning of this project, it is essential to consider the incorporation of complementary initiatives that can complement the core strategy, such as Smart Loading Zones, which allow delivery operators to enroll for Smart Loading permits that can share vehicle location data to seamlessly pay for their use of curbsides on a per-minute basis. Smart Zones can also allow authorized drivers to reserve a space for a limited amount of time through a smartphone app or other mechanism, which can encourage more orderly curbs.

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ESTIMATED COST & FUNDING

The cost for this study is estimated to be between \$500,000 to \$750,000 and will vary depending on the size and whether it recommends a pilot or broader implementation.

The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Caltrans: Sustainable Transportation Planning Grants
- FHWA: Carbon Reduction Program

SAMPLE DEVELOPMENT SCHEDULE

The program will require three to five years for full implementation, including all required study, program, and policy development and pilot design. The sample schedule below summarizes the major milestones in the program development process.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Program Development	
<i>Project initiation: Regulatory Policy Framework and Compliance, Technology Assessment, Pilot program design</i>	6-12 months
<i>Community & Stakeholder Outreach and engagement</i>	Ongoing throughout planning and program development activities
<i>Planning and Policy Development</i>	18-24 months following identification of study funding
<i>Program or Pilot implementation, including infrastructure preparation, data collection and analysis, evaluation, and adjustment</i>	18-36 months following the planning study
Environmental & Regulatory Review	
<i>CEQA/NEPA review</i>	Exempt

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

In the planning of this project, it is essential to consider the incorporation of complementary initiatives that can complement the core strategy, such as Smart Loading Zones, which allow delivery operators to enroll for Smart Loading permits that can share vehicle location data to seamlessly pay for their use of curbsides on a per-minute basis. Smart Zones can also allow authorized drivers to reserve a space for a limited amount of time through a smartphone app or other mechanism, which can encourage more orderly curbs.



The potential challenges of program implementation include:

- Jurisdictional coordination
- Creating responsive regulations that adapt to changing conditions and ensure equitable access for various users like vehicles, pedestrians, and cyclists
- Lack of availability of real-time data inputs collected from sensors, cameras, and other technologies.
- Cities have encountered implementation challenges, including local business pushback, technical challenges, and regulatory barriers.

The program's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities of planning and design.

POLICY FACT SHEET

OVERWEIGHT TRUCK ROUTE PLANNING

Increasing weight limits along corridors is a strategic way to improve the efficiency of the goods movement system and has the potential to advance the electrification of the freight transportation network.

Benefits

- Allows for heavier electric freight vehicles to travel along corridors that previously had weight restrictions.
- Removing weight restrictions has potential to advance planning and development of electrification projects along transportation corridors.



Study the potential for increasing weight limits for battery electric medium- and heavy-duty vehicles on Clean Freight Corridors and other truck routes, and policy support for legislative changes. Potential corridors include I-5, I-15, I-8, I-805, SR 905, and SR 11. The result of this study could include recommendations for policy and infrastructure changes to support electric truck operations on these and other routes.

ESTIMATED COST & FUNDING

A study to develop the policy and evaluate its potential implementation is estimated to cost \$400,000 to \$800,000 depending on the number and degree of detail of corridors studied. It is envisioned that this study would detail the potential policy and regulatory changes needed to enable battery electric vehicles to operate on San Diego and Imperial County highways, including an assessment of the vehicles available in the market that would be deployed in this area. That assessment would enable policymakers to understand what type of wear and tear would be expected on the roadway system and what, if any, infrastructure improvements should be anticipated based on the anticipated reduced lifecycle of roads and bridges.

The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

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- Caltrans: Sustainable Transportation Planning Grants
- FHWA: Carbon Reduction Program
- FHWA: Multimodal Project Discretionary Grant Program

SAMPLE DEVELOPMENT SCHEDULE

The study to develop and evaluate the policy will require two to three years to complete, including all required planning, evaluation, and stakeholder engagement. The sample schedule below summarizes the major milestones in the policy development process.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning and Policy Study	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning and policy development activities
<i>Data Gathering and Analysis</i>	6-8 months following identification of study funding
<i>Technical Study and Recommendations</i>	18-24 months following data gathering and analysis
Policy Development	6-12 months following completion of study, including jurisdictional reviews and approvals
Environmental & Regulatory Review	
<i>CEQA/NEPA review</i>	Exempt

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

In the planning of this project, it is essential to consider the incorporation of complementary satellite initiatives that can enhance the core strategy, such as truck parking, electric truck charging, and truck-only lanes. These additional strategies would provide compound benefits to the freight network and have multiplier effects for sustainability benefits.

The potential challenges of policy implementation include:

- The definition and enforcement of appropriate weight limits
- The additional impacts to infrastructure and a potential increase in wear on routes with increased weight limits, including possible preventive maintenance
- Economic impacts from an increase or decrease in truck volume along roadways
- Public acceptance both at the community and jurisdictional level

The program's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities of planning, policy development, and potential implementation.

POLICY FACT SHEET

LOW-EMISSIONS ZONES

Creating defined areas where the use of emitting freight vehicles is regulated can directly influence the vehicle fleet composition on public roadways to help advance the sustainability of our goods movement system and create benefits for the environment and equity. Identifying strategic locations across the region to pilot Low-Emission Zones (LEZs) with location-specific regulations will benefit the health of these communities and provide a framework for region-wide implementation.



Benefits

- Reduction of air pollution, improvement of public health, lowering of greenhouse gas emissions, and enhancement of quality of life for residents.
- Reduction of congestion from freight traffic and increased efficiency.
- Stimulus for the adoption of cleaner transportation technologies.

Establishing an LEZ in dense urban areas will enhance quality of life for residents and improve equity and health for disadvantaged communities. An LEZ could also catalyze investments in adoption of cleaner transportation technologies by signaling a demand for ZE freight vehicles.

LEZ initiatives can be introduced through regulations and sustainability directives or financial incentives. This study would examine examples nationally and internationally to identify the type of program and incentives that would be most appropriate for Southern California. The study would also consider locations within the region that would be most appropriate to implement a pilot LEZ program.

Similar studies include:

- London LEZ: The zone, which includes most of Greater London, enforces an emissions standard based charge to non-compliant commercial vehicles. With implementation of the LEZ, the zone observed a 44 percent reduction of NO₂ emissions between 2017 and 2020
- City of Santa Monica, Zero Emission Delivery Zone Pilot: In partnership with the Los Angeles Cleantech Incubator, the City deployed a pilot voluntary Zero Emission Delivery Zone. The zone encompasses a 1-square-mile area in the commercial activity core of Santa Monica and prioritizes ZE last-mile delivery. One of the City's goals for the pilot is to provide a blueprint for cities to adopt ZE delivery zones and provide best practices for other ZE zones.

ESTIMATED COST & FUNDING

The study to evaluate the potential implementation of this policy is estimated to cost \$250,000 to \$500,000 depending on the range of locations and regulations considered.

The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- FHWA: Strengthening Mobility and Revolutionizing Transportation Program
- Caltrans: Sustainable Transportation Planning Grants
- FHWA: Carbon Reduction Program

The **San Diego and Imperial Counties Sustainable Freight Implementation Strategy** is reviewing and evaluating a wide range of projects, programs, policies, and workplace development strategies to help improve San Diego's regional goods movement system. For more details, please visit: <https://www.sandag.org/projects-and-programs/goods-movement-planning/>.

SAMPLE DEVELOPMENT SCHEDULE

The policy will require two to four years for completion, including all required planning and public engagement. The sample schedule below summarizes the major milestones in the policy development process.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Policy Study	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning activities
<i>Data Gathering and Analysis</i>	6-8 months following identification of study funding
<i>Pilot or Program Development and Recommendations</i>	12-18 months following data gathering and analysis
Pilot or Program Implementation	12-24 months following completion of pilot or program development, including jurisdictional reviews
Environmental & Regulatory Review	
<i>CEQA/NEPA review</i>	Exempt

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

In the planning of this project, it is essential to consider the incorporation of complementary satellite initiatives that can complement the core strategy, such as cargo bikes, ZE truck charging, and curb regulations.

The potential challenges of policy implementation include:

- Identifying appropriate incentive funding sources

- Ensuring that freight delivery companies have access to clean fuel technology vehicles and charging infrastructure
- Establishing clear and enforceable emission standards and restrictions, along with defining the boundaries of LEZs
- Ensuring widespread compliance and enforcement mechanisms to identify and penalize high-emission vehicles, if regulatory approach is taken
- Obtaining appropriate approvals if regulatory approach is taken

Impacting businesses and considering alternative transportation options for affected businesses and individuals The program's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities of planning and design.

POLICY FACT SHEET

RECOMMENDATIONS ON LAND USE COMPATIBILITY

Land use strategies related to freight can support freight operations while minimizing adverse impacts on local residents and the environment. A study to identify recommendations on land use compatibility will support the creation of benefits for the environment, safety, and equity, while meeting freight operational needs.

Benefits

- More efficient land utilization and decreased land-use disputes.
- Increased community cohesion, improved quality of life for residents, and enhanced safety.
- Minimized noise and visual impacts on residents.
- Improved freight capacity while reducing congestion.
- Improved accessibility to the freight transportation network for communities and businesses.

Freight generating land uses can bring benefits to a region by providing jobs, tax dollars, and proximity of goods to growing populations and businesses. However, negative impacts associated with freight and industrial land uses include congestion, air quality and greenhouse gas emissions, noise, and safety. Vulnerable communities often receive significant environmental impacts from freight generating land uses. Developing recommendations on land use compatibility for freight will allow freight operations to provide benefits to the region while identifying opportunities to minimize adverse impacts.

Recommendations on land use compatibility will consider truck parking, warehouses, and industrial uses, as well as increasing buffer zones near residential, schools, and other sensitive uses. Adequate and strategically located authorized truck parking can increase efficiency, safety, and environmental benefits by reducing the need for driver circulation and conflicts with sensitive land uses by parking in unauthorized locations. Recommendations will consider appropriate areas to maintain or add truck parking and industrial land use availability.



The ***San Diego and Imperial Counties Sustainable Freight Implementation Strategy*** is reviewing and evaluating a wide range of projects, programs, policies, and workplace development strategies to help improve San Diego's regional goods movement system. For more details, please visit: <https://www.sandag.org/projects-and-programs/goods-movement-planning/>.

ESTIMATED COST & FUNDING

The study to evaluate recommendations on land use compatibility is estimated to cost \$400,000 to \$600,000 depending on the scope of stakeholder and community engagement and if design guidelines are included.

The project team evaluated potential funding opportunities and identified several discretionary funding programs for which this strategy may be eligible. The most promising funding opportunities include:

- Caltrans: Sustainable Transportation Planning Grants
- FHWA: Carbon Reduction Program

SAMPLE DEVELOPMENT SCHEDULE

The policy will require one to two years for completion, including all required planning and public engagement. The sample schedule below summarizes the major milestones in the policy development process.

Milestone	Estimated Schedule
Identification of Project Funding	Ongoing
Planning & Policy Study	
<i>Community & Stakeholder Outreach</i>	Ongoing throughout planning activities
<i>Data Gathering and Analysis</i>	2 months following identification of study funding
<i>Recommendations</i>	10-22 months following data gathering and analysis
Environmental & Regulatory Review	
<i>CEQA/NEPA review</i>	Exempt

IMPLEMENTATION CONSIDERATIONS & CHALLENGES

In the planning of this study, it is essential to consider the incorporation of complementary satellite initiatives that can enhance the core strategy, including LEZs, truck charging and staging areas, and truck parking site development. The integration of these auxiliary strategies holds the potential to enhance the overall efficiency and effectiveness of the transportation network.

The potential challenges of policy implementation include:

- Extensive research and analysis to ensure that land use recommendations align with community needs, environmental considerations, and economic development goals
- Gaining buy-in and cooperation from various stakeholders, including property owners, local governments, and developers

- Navigating zoning regulations, land use planning, and community input while striving for optimal land use compatibility demands effective communication, collaboration, and a fine-tuned policy framework

The program's lead agencies can mitigate these challenges through early coordination with stakeholders and regulatory agencies, to help lead all parties through the complexities implementing this planning policy.

Appendix I:

Workforce Development Toolkit Memorandum



SAN DIEGO AND IMPERIAL COUNTIES SUSTAINABLE FREIGHT IMPLEMENTATION STRATEGY

WORKFORCE DEVELOPMENT TOOLKIT

February 2024

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INTRODUCTION

As part of the San Diego and Imperial Counties Sustainable Freight Implementation Strategy, this Workforce Development Toolkit offers analysis and solutions for the sustainable freight workforce in San Diego and Imperial Counties. The toolkit has two main components: labor market analysis and an inventory of relevant training and education programs. To support the sustainable freight projects and programs that are in development and upcoming in the region, the workforce needs to train for emerging skills and occupations.

Labor market analysis tools that search internet-wide for publicly available job market information can be used to assess the historical as well as near real-time state of the workforce. For example, gaps in needed skills can be identified by looking at what occupations and skills are being requested by employers in job postings compared to those offered by job seekers in resumes and job profiles. Particularly in sustainable freight, emerging jobs create demand for skills that cannot always be fulfilled by the current workforce. The changing demands of dynamic work environments need to be supported by sufficient, accessible, and nimble training programs, as discussed in the recent report [Trade and Transportation Talent Pipeline Blueprints: Building University-Industry Talent Pipelines in Colleges of Continuing and Professional Education](#).

This toolkit used [Lightcast](#), a labor market analysis software, to describe the state of the sustainable freight workforce in San Diego and Imperial Counties. Lightcast analyzes all publicly accessible internet job postings and profiles (i.e. resumes) in near real-time for specific industries, occupations, job skills, regions, and more.

Labor market analysis gives a broad scope of the state of a workforce and can be used to inform decisions on training development, hiring, funding allocation, project prioritization, and more. Looking at the demand for sustainable freight-related occupations in San Diego and Imperial Counties helps inform whether education and training organizations should develop programs and curricula for the emerging skills that are needed for upcoming projects and programs.

About Lightcast Data Sources

Data sources for Lightcast include company and career sites, national and local job boards, and job posting aggregators. Job re-posting, e.g. when a posting on a company website is reposted to Indeed, is factored into the analytics so the numbers are not skewed.

Earlier work in the project, especially Task 2: Technical Advisory Committee and Task 5: Public Outreach Plan, informed the development of this toolkit. Through these tasks, the project team gathered feedback on sustainable freight workforce issues from stakeholders in the region via presentations, focus groups, interviews, and surveys. The following are key takeaways:

- Training for sustainable freight jobs is needed to ensure job quality, safety, and the proper management of transitions to emerging technology.
- Sustainable freight projects may create peripheral jobs such as truck parking, security, and maintenance.
- Training and hiring for sustainable freight jobs should target communities affected by freight emissions and/or sustainable freight project construction. Youth, e.g. high school students, should be engaged to raise awareness of sustainable freight career opportunities.
- Funding for high-level training in emerging industries is needed. The need must be supported by research to show there will be sufficient demand to justify training.
- Conducting an education campaign may be an appropriate strategy. Many community members are not aware of these emerging industries and associated high-paying jobs.

SUSTAINABLE FREIGHT LABOR MARKET ANALYSIS

The [California Sustainable Freight Action Plan \(CSFAP\): Freight Workforce Development Project](#) by California State University, Long Beach’s Center for International Trade and Transportation defines the sustainable freight workforce as occupations with competencies that are foundational to addressing the role of sustainability within all organizations, across multiple industries and in both the public and private sector. Sustainable freight competencies identified by the Freight Workforce Development Project are listed below.

- Identifying stakeholders in the freight supply chain
- Understanding regulatory compliance
- Understanding energy, infrastructure, and sustainability ecosystems
- Using data and metrics for process improvements and reducing transaction costs
- Understanding legal issues in risk management

Definition of the “Sustainable freight workforce”
“Occupations with competencies that are foundational to addressing the role of sustainability within all organizations, across multiple industries and in both the public and private sector.”

Analyzing and Presenting Data

Analyzing the labor market requires relevant standardized occupation and industry categories. Standardized occupation classification (SOC) and Occupational Information Network (O*NET) codes are the categorizations used most often by the U.S. Census Bureau and U.S. Department of Labor and labor market analysis tools. Lightcast allows users to provide keywords to assist in identifying SOCs. This analysis is based on the following “sustainable freight” keywords identified by the team experts: battery electric, brokerage, CAD/drafting, cargo bikes, charging, compliance, construction, electric/electrification, engineering (civil), freight, grant writer, hydrogen, inventory, landscape architect, logistics, planner, platooning, safety, sustainable freight, traffic, trucking, zero emission.

Selected keywords are intentionally broad. Particularly with new industries like sustainable freight, job titles vary, occupations have skill crossover, and emerging skills take time to be included in standardized occupation and skill taxonomies.

Mind the Gap Between Job Postings and Employee Skillsets

This analysis explores job posting requests versus employee profile availability of the top specialized skills for 25 sustainable freight related SOCs between January 2022 and October 2023. Table 1 lists the occupations identified as input using the search terms listed above.

Table 1: Sustainable Freight-Related Occupations (Lightcast Input)

Title	SOC	Title	SOC
Transportation, Storage, and Distribution Managers	11-3071	Urban and Regional Planners	19-3051
Construction Managers	11-9021	Sales Representative, Wholesale and Manufacturing, Technical and Scientific Products	41-4011
Compliance Officers	13-1041	Customer Service Representatives	43-4051
Logisticians	13-1081	Cargo and Freight Agents	43-5011
Project Management Specialists	13-1082	Dispatchers, Except Police, Fire, and Ambulance	43-5032
Landscape Architects	17-1012	Construction Laborers	47-2061
Civil Engineers	17-2051	Electrical and Electronics Installers and Repairers, Transportation Equipment	49-2093
Electrical Engineers	17-2071	Electrical and Electronics Repairers, Commercial and Industrial Equipment	49-2094
Environmental Engineers	17-2081	First-Line Supervisors of Production and Operating Workers	51-1011
Architectural and Civil Drafters	17-3011	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	51-2028
Electrical and Electronics Drafters	17-3012	First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	53-1047
Electrical and Electronic Engineering Technologists and Technicians	17-3023	Transportation Inspectors	53-6051
Environmental Engineering Technologists and Technicians	17-3025		

Figure 1 shows the output comparison of specialized skill availability. According to this, construction and subcontracting are two high-demand technical skills not sufficiently available in the workforce at the time of this analysis. Other skills with significant gaps include call center experience, electrical engineering, procurement, and change orders.



Figure 1: 2022-2023 Top Specialized Skills in Job Postings vs Job Profiles in San Diego and Imperial Counties for Sustainable Freight Occupations: Output Bar Chart

Following Changes in Occupational Demand Over Time

This analysis explores the change in occupation count for sustainable freight-related industries in San Diego and Imperial Counties from January 2022 to October 2023. The industries were identified with the same search keywords listed above. Figure 2 shows that the largest increases were in General Freight Trucking, Freight Transportation Arrangement, and Other Support Activities for Transportation. The largest decrease was in the Rail Transportation industry. The full Lightcast output is in Appendix C.

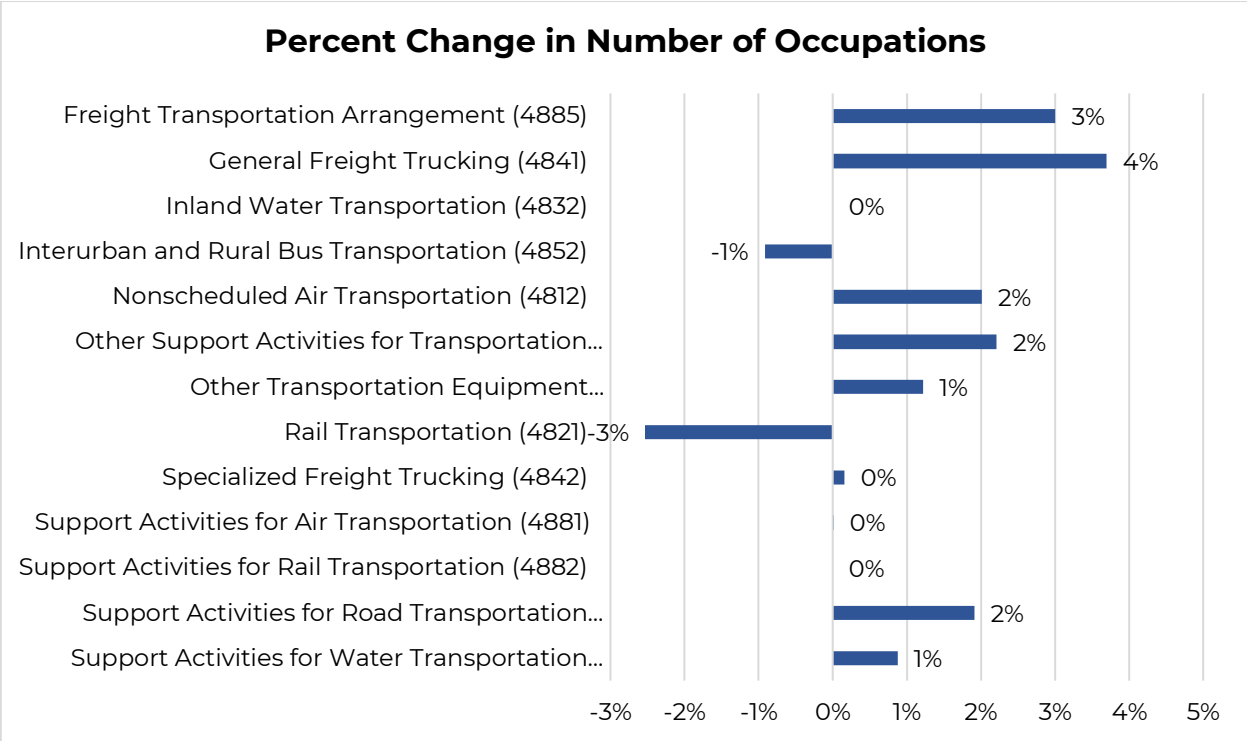


Figure 2: Percent Change in Number of Occupations from January 2022 to October 2023 in Sustainable Freight-related Industries and San Diego and Imperial Counties

SUSTAINABLE FREIGHT TRAINING PROGRAMS IN SAN DIEGO AND IMPERIAL COUNTIES

Once sustainable freight skill and occupation gaps have been identified, training and education programs need to be in place to upskill the workforce with the proper expertise and fill the occupations in demand. Developing and filling these programs requires employer interest and a proactive, self-selecting sustainable freight workforce. The following tables contain an inventory of current relevant programs that provide training for skills in demand for sustainable freight projects and programs. Table 2 is an inventory of programs within San Diego and Imperial Counties, Table 3 has programs in the greater surrounding area, and Table 4 has online programs.

Programs were included if relevant to degrees, certifications, or skills required by sustainable freight job postings, consistent with those in the Lightcast labor market analysis. Among sustainable freight job postings, the most frequent degrees required were Public Administration, Transportation Planning, and Urban Planning. These degrees were added to a list that was cross referenced with the programs offered by schools in and around San Diego and Imperial Counties.

Sources include niche.com, [San Diego Tourism Authority website](https://www.sandag.org), [Imperial County website](https://www.imperialcounty.gov), and workforce development team expert recommendations.

Table 2: Sustainable Freight-Related Degrees, Certificates, and Training Programs in San Diego and Imperial Counties

Program	Colleges and Universities					
Apprenticeship Readiness Program	San Diego Workforce Partnership					
Architecture Technology	Southwestern College California A.S. & C					
Architecture	Southwestern College California A.S					
Civil Engineering	San Diego State University B.S. & M.S					
Construction Career Jumpstart	San Diego Workforce Partnership					
Economics	San Diego State University B.A.	San Diego Mesa College A.A	California State University - San Marcos B.A & M.A	San Diego City College A.A	University of California - San Diego B.A	Imperial Valley College B.A.
International Studies - Economics	University of California - San Diego B.A					
Environmental Engineering	San Diego State University B.S. & M.S					
Engineering Concentration Sustainability	University of San Diego B.S					
Electrical Engineering	San Diego State University B.S. & M.S	California State University - San Marcos B.S	University of San Diego B.S	Point Loma Nazarene University B.S		
Electrical and Computer Engineering	Point Loma Nazarene University B.S	University of California - San Diego B.S				
Engineering	Southwestern College California A.S					

Program	Colleges and Universities					
Environmental Studies	California State University - San Marcos B.A	Point Loma Nazarene University B.A	San Diego State University C			
Environmental Systems	University of California - San Diego B.S					
Geography, Emphasis in Environment, Sustainability, and Policy	San Diego State University B.S					
Sustainability	San Diego State University B.A	San Diego Mesa College C & A.A	San Diego City College C	UCSD extension program C		
Sustainable Energy Studies	Southwestern College California C					
Industrial and Systems Engineering Concentration Sustainability	University of San Diego B.S					
Logistics and Supply Chain Management	National University B.S					
Supply Chain Management and Logistics Technology	Southwestern College California A.S					
Public Administration	Southwestern College California A.A	San Diego State University B.A & B.S	Point Loma Nazarene University B.A	National University B.A & M.P.A	SDSU Imperial Valley B.A.	
Supply Chain Management	MiraCosta College C	University of San Diego B.S & M.S	San Diego State University B.S	University of California - San Diego B.S		
Urban Studies	San Diego State University B.A	University of California - San Diego B.A				
Urban Studies Urban Sustainability Specialization	San Diego State University B.A					
Civil Engineering	San Diego State University B.S					

Program	Colleges and Universities					
Master of City Planning	San Diego State University					
Operations and Supply Chain Management	California State University - San Marcos B.S					
Management Science	University of California - San Diego B.S					
Master of Public Policy	University of California - San Diego M.P.P					
Sustainable Business Practices	UCSD extension program C.					
Environmental Management	UCSD extension program C.					
Urban Planning and Preservation	UCSD extension program C.					
Industrial Automation Technology	Imperial Valley College C.					
Automotive Technology	Imperial Valley College C.					
Automotive Technology: Maintenance and Basic Repair	Imperial Valley College C.					
Commercial Truck Driving Training Class A	Imperial Valley Regional Occupation Program C.	CET El Centro C.				

Table 3: Sustainable Freight-Related Degrees, Certificates, and Training Programs In Areas Surrounding San Diego and Imperial Counties

Program	Colleges and Universities					
Architecture	University of Advanced Studies B.A	University of Tijuana B.A	Tijuana Institute of Technology B.A			
Business Administration	University of the Californias B.A	Graduate Center of the Northwest B.A	CSU San Bernardino MBA	University of California Irvine B.A & A.A	CETYS University B.A	University of Advanced Studies B.A
Business Administration, Operations and Supply Chain Management Option	California State University - Long Beach B.S					
Economics	CSU San Bernardino B.A	University of California Irvine B.A	Autonomous University of Baja California A.A	California State University - Long Beach B.A		
Business Economics	California State University - Long Beach B.A	University of California Irvine B.A				
Environmental Engineer	University of California Irvine B.S	Tijuana Institute of Technology B.S				
Energy Engineering	Polytechnic University of Baja California B.S					
Renewable Energy Engineering	CETYS University B.S	Autonomous University of Baja California B.S	Mexicali Institute of Technology B.S	Technological University of Tijuana B.S		
Environmental Sciences	CSU San Bernardino M.S					
Environmental Studies	University of Redlands B.A	CSU San Bernardino B.A				

Program	Colleges and Universities					
Foreign Trade and Customs Legislation	University of Tijuana B.A					
Global Logistics Professional	California State University - Long Beach C.					
International Logistics	CETYS University B.S					
Purchasing, Logistics, and Supply Chain	University of Redlands C.					
Logistics Management	Norco College C.					
Science in Logistics & E-Commerce	CSU San Bernardino M.S					
International Business	Autonomous University of Baja California A.A					
Public Administration	CSU San Bernardino M.P.A					
Public Policy	University of Redlands A.A	University of California Irvine M.P.P				
Supply Chain Automation	Norco College C.					
Supply Chain Management	CSU San Bernardino C.	Coastline College C.	California State University - Long Beach M.S			
Supply Chain Technology	Norco College C.					
Urban and Regional Planning	University of California Irvine Master					
Urban and Environmental	University of California Irvine Ph.D					

Program	Colleges and Universities					
Planning and Policy						
Transportation Science	University of California Irvine Ph.D					
Civil and Environmental Engineering	University of California Irvine M.S.					
Electrical Engineering	University of California Irvine M.S. & B.S.					

Table 4: Sustainable Freight-related Online Certificates

Program	Organization
Certified Supply Chain Professional (CSCP)	Association for Supply Chain Management
Certified in Production and Inventory Management (CPIM)	Association for Supply Chain Management
Supply Chain Operations Reference (SCOR)	Association for Supply Chain Management
Certification in Logistics, Transportation and Distribution (CTLD)	Association for Supply Chain Management
Certified Professional in Supply Management (CPSM)	Institute for Supply Management (ISM)
Energy Industry Fundamentals 2.0 Certificate Program	Center for Energy Workforce Development (CEWD)
SCPro™ Certification	Council of Supply Chain Management Professionals (CSCMP)

RECOMMENDATIONS

A labor market analysis was conducted and indicated that there is a supply and demand gap in the fields of construction, electrical engineering, and procurement. Currently, only one training program in the region addresses the construction skills gap: the Construction Career Jumpstart program by the San Diego Workforce Partnership. There is a different case with the gap in the skill of electrical engineering: there are many training programs in and around San Diego and Imperial Counties. However, the typical electrical engineering student has a broad range of career and industry options upon graduation, and sustainable freight is one of many. There is a similar situation with the procurement skills gap: there are several business administration and logistics management degree and certificate programs both in the region and online that teach about procurement, so there needs to be stronger awareness or incentives for those students to go into sustainable freight. Therefore, a lack in training is not the only challenge; there is also not enough information being provided to potential candidates on the availability of jobs in sustainable freight from the training and education institutions and other agencies.

Labor market analysis tools can be leveraged to keep an awareness of workforce needs as new sustainable freight projects and technologies change the skills and occupations in demand. The analyses need to be considered within the context of the limitations of using standardized occupation and skill taxonomies because nascent job titles or skills may not be present in the output, but the near-real-time data provided from across the internet serves as a valuable overview. Sustainable freight as an area of study is still in development and reflects a merger of traditional disciplines. There is an opportunity to provide new content through existing programs. Absent adequate training programs, employers will look for opportunities to build upon more general and foundational skills and then teach to their own work culture.

To prepare for the evolution of workforce needs as identified in labor market analyses, existing training and degree programs will need to accommodate the demand for emerging skills. Public agencies could assist in the development of modular instruction, with subject matter experts, for the identified skills that instructors in degree and training programs can easily plug into existing courses. In the longer term, public agencies could support curricular development and implementation of education and training programs through the development of a Workforce Development Committee (WDC). The committee could keep a pulse on the changing skills and occupations in demand for sustainable freight projects and programs in the region. The committee can leverage labor market analysis and include members from stakeholders in the region that will promote training related to jobs that will face a shortfall of labor. Training stakeholders can include those listed in Table 2, the inventory of sustainable freight degrees and training in San Diego and Imperial Counties, as well as companies, public agencies, and other stakeholders that work

directly and indirectly on sustainable freight projects and programs. A committee composed of these stakeholders creates a forum for discussion on relevant and emerging skills, jobs, and training between public agencies, experts in sustainable freight, and experts in training program development. Specific actions for the committee include the following:

- The committee could convene leaders in industry, government, and education to design, pilot, and scale modules that any instructor could use to address sustainable freight skills gaps. Developing such modules would assist traditional academic institutions by providing plug-and-play sustainable freight modules that instructors at training programs in San Diego and Imperial Counties could use in the near term. Careful measuring and tracking of the success of these modules would be an important part of this deployment.
- The committee could use the same process to develop not-for-credit certifications and custom training in collaboration with continuing and professional education and extension units. This approach would ensure that emerging, incumbent, and displaced professionals have access to non-degree sustainable freight development opportunities.
- In support of the preceding two recommendations, the WDC could help identify expert practitioner guest speakers to participate in the credit and not-for-credit education and training programs.
- In the longer term, the committee could work with leaders in industry, government, and education to develop targeted sustainable freight courses with articulation agreements between community colleges, four-year, and graduate programs to create new sustainable freight educational pathways.
- After implementing, measuring, and tracking the success of the preceding four recommendations, the committee could convene champion educators to host a train-the-trainer session to disseminate lessons learned and best practices to less initiated teachers.

Training programs such as the California Sustainable Freight Action Plan Sustainable Freight Certificate are developed with labor market analysis and stakeholder input and can serve as a model for providing training in response to changing workforce demands. Incorporating feedback and recommendations from public, private, and academic sustainable freight project stakeholders leads to training programs and curricula that provide the most relevant skills in demand. The Sustainable Freight Certificate comprises six sessions and a capstone project that covers the topics and skills shown in Figure 3. The certificate was designed in response to the emergence of zero emission vehicles and related policies, but the approach can be replicated to address any skill that is new or facing increased demand. If developed specifically for San Diego and Imperial Counties, labor market analysis and stakeholders could inform curricular development so that the

skills could be modified to be most relevant to the sustainable freight projects and programs in the region.



Figure 3: California Sustainable Freight Action Plan: Sustainable Freight Certificate Session Structure: Six sessions and a Capstone Project

Additionally, employer-focused approaches to addressing the demand for emerging skills could complement training provided at external organizations. A public agency could develop and/or provide materials for consumption that educate employers on alternative hiring approaches. Such approaches include hiring non-traditional employees (i.e., those who do not have the most directly relevant degree or certification) and providing in-house training and upskilling as part of onboarding new hires.

APPENDICES:

Appendix A: Glossary

[Industry](#): A group of businesses that produce similar goods and/or services and share similar production processes for creating the goods and services they sell.

[Job](#): Any position in which a worker provides labor in exchange for monetary compensation.

[Occupation](#): Refers to professions or careers in the workforce. The occupation describes the role—what the worker actually does. This is distinct from the job title, which is what the worker is called. Occupations are also differentiated from jobs, as jobs show the count of positions held within a certain occupation.

[Occupation Code](#): A standardized code that refers to a certain occupations. Commonly used occupation codes include Standardized Occupation Classification (SOC) codes and the Occupational Information Network (O*NET) codes.

[Occupation Group](#): A level of workforce taxonomy that identifies roles that are the same, across employers and geographies, regardless of job title.

Appendix B: Labor Market Skills Gap Analysis Table Output

Table B: 2022-2023 Top Specialized Skills in Job Postings vs Job Profiles in San Diego and Imperial Counties for Sustainable Freight Occupations: Raw Numbers

Skills	Postings	% of Total Postings	Profiles	% of Total Profile
Project Management	13,821	24%	19,388	24%
Construction	7,377	13%	4,564	6%
Subcontracting	4,032	7%	1,803	2%
Marketing	3,645	6%	6,650	8%
Construction Management	3,527	6%	3,795	5%
Call Center Experience	3,388	6%	785	1%
Electrical Engineering	3,269	6%	2,118	3%
Procurement	3,071	5%	2,031	2%
Customer Relationship Management	2,985	5%	2,871	4%
Change Orders	2,836	5%	1,358	2%

Appendix C: Labor Market Trend Analysis Table Output

Table C: 2022-2023 Occupation Group Changes for Sustainable Freight-related Industries in San Diego and Imperial Counties

NAICS	Industry	Occupation Group Jobs in Industry (2022)	Occupation Group Jobs in Industry (2023)	Change (2022 - 2023)	% Change (2022 - 2023)	% of Occupation Group in Industry (2022)	% of Total Jobs in Industry (2022)
4885	Freight Transportation Arrangement	904	931	27	3%	1.0%	35.9%
4841	General Freight Trucking	485	503	18	4%	0.5%	10.4%
4842	Specialized Freight Trucking	298	298	0	0%	0.3%	10.4%
4881	Support Activities for Air Transportation	259	259	0	0%	0.3%	10.6%
4884	Support Activities for Road Transportation	237	241	5	2%	0.3%	14.2%
4859	Other Transit and Ground Passenger Transportation	125	128	4	3%	0.1%	15.3%
4854	School and Employee Bus Transportation	27	27	(0)	(1%)	0.0%	5.0%
4883	Support Activities for Water Transportation	26	26	0	1%	0.0%	8.4%
4821	Rail Transportation	21	21	(1)	(3%)	0.0%	9.9%
4852	Interurban and Rural Bus Transportation	17	17	(0)	(1%)	0.0%	11.0%
4889	Other Support Activities for Transportation	15	15	0	2%	0.0%	11.9%
4812	Nonscheduled Air Transportation	13	14	0	2%	0.0%	5.9%
3369	Other Transportation Equipment Manufacturing	10	10	0	1%	0.0%	7.1%

Appendix D: Sustainable Freight-Related Degrees, Certificates, and Training Programs in San Diego and Imperial Counties, by Degree Type

Table D: Sustainable Freight-related Degrees, Certificates, and Training Programs in San Diego and Imperial Counties

Colleges and Universities	Program	Degree Type				
		Certificate/ Skills Certificate	Certificate Program	Associate Degree	Bachelor's Degree	Master's Degree
Southwestern College California	Supply Chain Management and Logistics Technology		✓	✓		
	Sustainable Energy Studies	✓				
	Architecture			✓		
	Engineering			✓		
	Architecture Technology	✓		✓		
	Public Administration			✓		
MiraCosta College	Supply Chain Management	✓				
San Diego State University	Urban Studies, Urban Sustainability Specialization, B.A. in Liberal Arts and Sciences				✓	
	Sustainability				✓	
	Geography, Emphasis in Environment, Sustainability, and Policy				✓	
	Civil Engineering				✓	✓
	Economics				✓	✓
	Electrical Engineering				✓	✓
	Environmental Engineering				✓	
	Public Administration	✓			✓	✓
	Urban Studies				✓	
Master of City Planning					✓	
SDSU Imperial Valley	Public Administration				✓	
San Diego Mesa College	Sustainability	✓		✓		
	Economics			✓		
California State	Operations and Supply Chain Management				✓	

Colleges and Universities	Program	Degree Type				
		Certificate/ Skills Certificate	Certificate Program	Associate Degree	Bachelor's Degree	Master's Degree
University - San Marcos	Electrical Engineering				✓	
	Economics				✓	✓
	Environmental Studies				✓	
Point Loma Nazarene University	Environmental Studies				✓	
	Engineering, B.S.E. Electrical Engineering Concentration				✓	
	Public Administration				✓	
National University	Logistics and Supply Chain Management				✓	
	Bachelor of Science in Electrical and Computer Engineering				✓	
	Public Administration				✓	✓
University of San Diego	Supply Chain Management				✓	✓
	Engineering Concentration Sustainability				✓	
	Architecture				✓	
	Electrical Engineering				✓	
	Industrial and Systems Engineering Concentration Sustainability				✓	
San Diego City College	Sustainability		✓			
	Economics			✓		
University of California - San Diego	Economics				✓	
	Management Science				✓	
	Environmental Systems				✓	
	Urban Studies and Planning				✓	
	International Studies - Economics				✓	
	Electrical and Computer Engineering				✓	
	Master of Public Policy					✓
San Diego Workforce Partnership	Apprenticeship Readiness Program		✓			
	Construction Career Jumpstart		✓			
	Economics			✓		

Colleges and Universities	Program	Degree Type				
		Certificate/ Skills Certificate	Certificate Program	Associate Degree	Bachelor's Degree	Master's Degree
Imperial Valley College	Industrial Automation Technology	✓				
	Automotive Technology	✓				
	Automotive Technology: Maintenance and Basic Repair	✓				
Imperial Valley Regional Occupational Program	Commercial Truck Driving Training Class A	✓				

Appendix E: Sustainable Freight-Related Degrees, Certificates, and Training Programs in Areas Surrounding San Diego and Imperial Counties, by Degree Type

Table E: Sustainable Freight-related Degrees, Certificates, and Training Programs Nearby San Diego and Imperial Counties (in surrounding area)

Colleges and Universities	Program	Degree type				
		Certificate/Skills Certificate	Certificate Program	Associate Degree	Bachelor's Degree	Master's Degree
University of Redlands	Purchasing, Logistics, and Supply Chain		✓			
	Environmental Studies				✓	
	Public Policy			✓		
CSU San Bernardino	Master of Business Administration					✓
	Bachelor of Arts in Economics				✓	
	Master of Science in Environmental Sciences					✓
	Bachelor of Arts in Environmental Studies				✓	
	Master of Science in Logistics & E-Commerce					✓
	Master of Public Administration					✓
	Certificate in Supply Chain Management	✓				
Norco College	Logistics Management	✓		✓		
	Supply Chain Automation	✓				
	Supply Chain Technology	✓				
Coastline College	Supply Chain Management	✓		✓		
California State	Supply Chain Management					✓

Colleges and Universities	Program	Degree type				
		Certificate/Skills Certificate	Certificate Program	Associate Degree	Bachelor's Degree	Master's Degree
University - Long Beach	Global Logistics Professional	✓				
	Business Administration, Operations and Supply Chain Management Option, B.S.				✓	
CET El Centro	Truck Driver		✓			
CETYS University	Business Administration				✓	
	International Logistics				✓	
	Renewable Energy Engineering				✓	
Autonomous University of Baja California	International Business			✓		
	Renewable Energy Engineer			✓		
	Economics			✓		
Mexicali Institute of Technology	Renewable Energy Engineer				✓	
Polytechnic University of Baja California	Energy Engineering			✓		
University of Advanced Studies	Business Administration				✓	
	Architecture				✓	
University of the Californias	Bachelor of Business Administration				✓	
Technological University of Tijuana	Renewable Energy Engineer				✓	
Graduate Center of the Northwest	Bachelor of Business Administration				✓	
University of Tijuana	Architecture				✓	
	Foreign Trade And Customs Legislation				✓	
	Architecture				✓	

Colleges and Universities	Program	Degree type				
		Certificate/Skills Certificate	Certificate Program	Associate Degree	Bachelor's Degree	Master's Degree
Tijuana Institute of Technology	Environmental Engineer				✓	