Appendices

Appendix A. 2014 CFMP Goals, Objectives, Strategies, and Accomplishments

The following are the six goals, objectives, and strategies from the 2014 CFMP. The projects and achievements to accomplish each goal are also presented.

Goal 1: Economic Competitiveness

Improve the contribution of the California freight transportation system to economic efficiency, productivity, and competitiveness.

Objectives

- Build on California's history of investments to seek sustainable and flexible funding solutions with federal, private, and green partners
- Invest in freight projects that enhance economic activity, freight mobility, reliability, and global competitiveness

Strategies

- Conduct a cost-benefit analysis for each freight project proposed for programming
- Reduce transportation costs by eliminating bottlenecks and recurrent delay, making operational improvements, and accelerating rapid incident response on priority freight corridors
- Seek creation of national, state, and regional dedicated freight funding programs
- Expand capacity of freight corridors or subsections through infrastructure or operational improvements
- Eliminate unnecessary freight lifts or handling
- Improve system condition and performance on priority freight corridors
- Coordinate with other states and regions to improve multi-jurisdictional freight corridors to reduce delay, increase speed, improve reliability, and improve safety

Accomplishments Since 2014

- Investments in freight infrastructure and mobility to enhance the State's economic activity, freight mobility, reliability, and global competitiveness
- The creation of new federal and state dedicated freight funding sources, such as:
    - The federal Fixing Americans Surface Transportation (FAST) Act that established the National Highway Freight Program (NHFP), providing California with approximately $535 million to fund projects that improve the efficient movement of freight on the National Highway Freight Network (NHFN) and support various federal freight goals
    - The State of California's Road Repair and Accountability Act of 2017, also known as Senate Bill (SB) 1, created a new Trade Corridor Enhancement Program (TCEP) providing approximately $300 million per year in state funding

for projects which more efficiently enhance the movement of goods along corridors

Goal 2: Safety & Resiliency

Improve the safety, security, and resilience of the freight transportation system.

Objectives

- Reduce rates of incidents, collisions, fatalities, and serious injuries associated with freight movements
- Utilize technology to increase the resilience and security of the freight transportation system

Strategies

- Reduce points of conflict on the freight system by constructing railroad grade crossings where there is a history of crashes and at crossings that have a high volume of vehicle and train traffic
- Create truck-only lanes and facilities, and encourage off-peak usage
- Fully implement positive train control (PTC)
- Expand number and scope of cargo security screenings
- Expand the system of truck parking facilities
- Ensure consistent and effective safety and security requirements at all California ports
- Identify alternate freight routes to maintain freight movement at times of disruption by disaster or other causes
- Inventory and assess risks for freight facilities vulnerable to sea level rise and other natural disasters and prioritize for abandoning, armoring, adapting, moving, or replacing

Accomplishments Since 2014

- The State of California's 2020-2024 Strategic Highway Safety Plan (SHSP), a data-driven plan reducing traffic-related fatalities and severe injuries on all public roads through:
    - Strategies and actions identified as having the greatest impact on road safety for all modes of travel and guidance for the investment of the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA) safety funding across multiple state departments
    - Actions identified and delivered through public and private industries representing the 4 Es of safety (Education, Enforcement, Emergency Services, and Engineering)
- Implementation of PTC on all California Class I Railways

Programmed and Constructed Projects

- Lake County SR 29 Expressway Project (SHOPP) – Caltrans District 1
  Facilitate the efficient flow of goods and service through Lake County, provide a facility

with the potential for diverting through traffic (including through truck traffic) from north shore SR 20, and improve the safety and operation of SR 29

- Yuba County SR 20 at Timbuctoo Improvements – Caltrans District 3
  Improve safety by reducing the number of run-off-road collisions on a section of SR 20 in Yuba County; provide a truck climbing lane
- Etiwanda Avenue Grade Separation – Rancho Cucamonga
  Widen and construct Etiwanda Avenue as a grade-separated roadway over the SCRRA/BNSF San Gabriel subdivision, currently an at-grade crossing; a grade separation reduces vehicles and truck delays and queuing along Etiwanda Avenue and improves mobility, safety, and level of service at the crossing
- Fyffe Grade Separation – Port of Stockton
  Improve safety by removing the at-grade crossing and eliminating the potential for vehicle/rail conflicts. Provides a critical, reliable emergency evacuation route for the employees, tenants, visitors, and emergency response vehicles at the Port of Stockton West Complex
- Rice Avenue and 5 Street Grade Separation – Caltrans District 7
  Eliminate conflicts between vehicles and trains at the rail-highway crossing
- 7th Street Grade Separation (East) – Alameda County Transportation Commission
  Realign and reconstruct the existing railroad underpass and multi-use path along 7th Street between west of I-880 and Maritime Street to increase vertical and horizontal clearances for trucks to current standards and improves the shared pedestrian/bicycle pathway
- SR 60 Truck Safety and Efficiency (Phase 1A) – Riverside County Transportation Commission
  Construct new eastbound climbing and westbound descending truck lanes from Gilman Springs Rd to approximately 1.47 miles west of Jack Rabbit Trail and upgrade existing inside and outside shoulders to standard width
- Quiet Zone Safety Engineering Measures

Goal 3: Freight System Infrastructure Preservation

Improve the state of good repair of the freight transportation system.

Objectives

- Apply sustainable preventive maintenance and rehabilitation strategies

Strategies

- Ensure adequate and sustainable funding for preservation of the freight system
- Expand scope of freight system rehabilitation projects to include facility modernization, where possible and merited, to increase range of available funding sources
- Make preservation projects multi-purpose
- Identify maintenance and preservation needs on priority freight corridors

Programmed and Constructed Projects

- District 1 - Del Norte - Highway 101 Hunter/Panther Creek Bridge Replacement
  Upgrade Hunter Creek and Panther Creek Bridges to meet current seismic and design standards; the existing structures are over 50 years old and do not meet Caltrans requirements for seismic safety
- District 1 - Humboldt - Highway 101 Redcrest Capital Pavement Maintenance (CPAM)
  Preserve and extend the service life of the existing distressed pavement on US 101, a critical north/ south interregional freight corridor
- District 3 - Placer – I-80 Bridge Rehabilitation
  Rehabilitate or replace deficient structural components at four over-crossings located at various locations along I-80 in Placer County. Interstate I-80 is a critical interregional east-west freight corridor which serves freight traffic moving from the Ports of Oakland and West Sacramento across the state, into Nevada, and beyond. Within the project limits, I-80 is a four-lane freeway with intermittent truck climbing lanes
- District 3 - Sacramento - SR 99 Rubberized Hot Mix Asphalt (RHMA) Overlay
  Preserve and extend this section of the pavement life on SR 99, a critical north/south interregional freight corridor travel by high volumes of heavy trucks
- District 4 - Solano - Interstate 80 -Bridge Rehabilitation
  Increase the vertical clearance of the six over-crossings over I-80 to standard 16'-6" to allow over-height and commercial permit vehicles to travel continuously along I-80 under these over-crossings
- District 6 - Fresno - SR 99 Roadway Rehabilitation (R2)
  Extend the service life of the pavement structure for a minimum of 40 years on a critical north/ south interregional freight corridor travel with high volumes of heavy trucks
- District 6 - Kings - SR 99 Kingsburg Rehabilitation Overlay
  Preserve and extend the pavement life on SR 99, a critical north/south interregional freight corridor travel by high volumes of heavy trucks
- District 6 - Kern - SR 99 Roadway Rehabilitation (R2)
  Resolve structure pavement failure on SR 99, a critical north/south interregional freight corridor, caused by high volumes of heavy trucks and restore the structural integrity by rehabilitating the roadbed
- District 7 - Los Angeles – I-5 Pavement Rehabilitation
  Preserve and extend the pavement life on I-5, a critical north/south interregional freight corridor traveled by high volumes of heavy trucks

Goal 4: Environmental Stewardship

Avoid and reduce adverse environmental and community impacts of the freight transportation system.

Objectives

- Integrate environmental, health, and social equity considerations into all stages of freight planning and implementation, including considering impacts and mitigation relative to the context of the project location
- Conserve and enhance natural and cultural resources

- Avoid and reduce air and water pollution, greenhouse gas (GHG) emissions, and other negative impacts associated with freight transportation by transitioning to a lower-carbon and more efficient freight transportation system
- Implement freight projects that demonstrate, enable, implement or incentivize use of advanced, clean technologies (including zero- and near-zero-emissions technologies) and efficiency measures needed to attain ambient air quality standards and achieve needed air toxics and GHG emission reductions

Strategies

- Establish corridor specific-impact reduction goals and projects
- Incentivize and prioritize freight projects that maximize GHG, criteria pollutant, and air toxin emission reductions
- Incentivize impact reduction
- Implement projects in freight corridors that are specifically targeted to avoid, reduce, or mitigate freight impacts on the environment and community
- Support and fund research focused on impact reductions and mitigation
- Ensure coordination and alignment of the Plan with State GHG reduction goals and requirements and State and federal air quality standards
- Develop an efficiency metric that captures the intensity of pollutants per unit of freight moved

Accomplishments Since 2014

- Adoption of the California Sustainable Freight Action Plan (CSFAP), freight targets, and pilot projects in 2016.
- Significant investments in all three CSFAP Pilot Projects:
    - Dairy Biomethane for Freight Vehicles: approximately $3 million from the California Energy Commission (CEC) for a community-scale advanced biofuels production project, and a minimum of five more projects to soon launch
    - Advanced Technology Corridors at Border Ports of Entry: Phases I and II, which includes 15 air quality monitors, funded through the TCEP and other Caltrans funds
    - Advanced Technology for Truck Corridors in Southern California: significant investments by the South Coast Air Quality Management District in zero-emission freight vehicles and equipment, and the I-10 Truck Parking Availability System fully funded through California, Arizona, New Mexico, and Texas
- Adoption of the Zero-Emission Vehicle (ZEV) Action Plan
- Deployment of an estimate of over 10,000 freight ZEV and equipment, with a goal of 100,000 deployed by 2030
- 60-98% reduction of criteria pollutants and 13% reduction of carbon dioxide emitted at the San Pedro Ports from 2005 to 2017, 98% reduction in truck emissions, and 76% reduction in vessel emissions at the Port of Oakland from 2009 to 2018
- Establishment of the Community Air Protection Program (pursuant to Assembly Bill (AB) 617) to reduce exposure in communities most impacted by air pollution

- Commitment to the Clean Transportation Program, the Cap and Trade system, and the Low Carbon Transportation Investments and the Air Quality Improvement Program, which includes freight-specific funding

Goal 5: Congestion Relief

Reduce costs to users by minimizing congestion on the freight transportation system.

Objectives

- Develop, manage, and operate an efficient, integrated freight system
- Identify causes and solutions to freight bottlenecks
- Invest strategically to optimize system performance

Strategies

- Create a multimodal freight bottleneck list for priority corridors and prioritize for correction
- Identify the most congested freight corridors and facilities and prioritize these for improvement
- Implement vehicle detection on priority corridors to identify problem areas across modes, particularly targeted to truck data
- Construct railroad grade separations at high volume roadway crossings
- Add mainline track and sidings to accommodate demand for freight and passenger rail services
- Implement system management and expand the freight travel information availability with the focus on freight corridors
- Expand freight travel information availability to the entire truck fleet

Accomplishments Since 2014

- Caltrans' collaboration with Metropolitan Planning Organizations and Regional Transportation Planning Agencies in the development of a performance target for truck travel time reliability on the interstate system
- Caltrans' continued analysis and reporting of the state's progress in reaching the FHWA's travel truck time reliability targets
- Caltrans' identification of major freight bottleneck locations, inclusion of those locations in the 2018 California Freight Mobility Plan Addendum, and the monitoring of the State's progress in reducing the congestion at those locations
- District 7: I-605 / SR 91 Interchange Improvement Gateways Cities Freight Crossroads
  This project reduces congestion, improves freeway operations on the mainline and ramps, and enhances safety on local and system interchange operations
- District 8: US 395 Widening from SR 18 to Chamberlain Way
  The widening improvements will reduce congestion and enhance the operational efficiencies on this critical north/south interregional freight corridor that carries a large volume of traffic with a high percentage of heavy trucks

- District 12: ORA-SR 57/ SR 91/ I-5 Install and Modify Intelligent Transportation System (ITS) Elements
  This project upgrades existing elements, facilitates heavy truck traffic flow, and deploys new elements to enhance the fail-safe system through redundancy in managing incidents and congestion during normal operations and special events

Goal 6: Innovative Technologies and Practices

Use innovative technology and practices to operate, maintain, and optimize the efficiency of the freight transportation system while reducing environmental and community impacts.

Objectives

- Support research, demonstration, development, and deployment of innovative technologies
- Promote the use of zero- and near-zero-emissions technologies within the freight industry to support the State Implementation Plan (SIP), attainment of California greenhouse gas reduction targets, and reduction of local air toxics
- Support and incorporate the use of low-carbon renewable fuels
- Promote innovative technologies and practices that utilize real-time information to move freight on all modes more efficiently

Strategies

- Prioritize Freight Plan projects implementing state-of-the-art and demonstration technologies
- Support deployment of new, non-fossil fuel distribution, recharging facilities, and shore-side power on the freight system, focusing on particular regions and corridors
- Support implementation of cleaner, quieter engine technologies
- Research opportunities for automation of certain freight movements

Accomplishments Since 2014

- Port Optimizer software at the Ports of Los Angeles and Long Beach is being implemented and is anticipated to significantly reduce port congestion
- $82.5M awarded through TCEP to border projects, which includes funding for Phases I and II of the Advanced Technology Corridors at Border Ports of Entry, a CSFAP Pilot Project on the Caltrans District 11 Border
- Continuation of the CEC's Clean Transportation Program, formerly known as the Alternative and Renewable Fuel and Vehicle Technology Program, to fund over $100 million per year to promote accelerated development and deployment of advanced transportation and fuel technologies
- Investments in zero-emission truck technologies leading to advancements in engine torque to reduce speed differentials and system mechanics that help reduce wear and tear on roadways
- Implementation of PTC to make freight rail transportation safer on the major freight rail corridors by automatically stopping a train before certain types of collisions occur

- Formation of workgroups to establish formal standards for medium- and heavy-duty charging
- Testing and deployment of truck platooning technologies
- Commitment to alleviating truck parking issues through:
    - The launch of americantruckparking.com
    - Testing and soon deploying truck parking availability systems
    - Forming the Truck Parking Technical Advisory Committee
- Establishment of the San Diego Unmanned Aircraft System (UAS) Integration Pilot Program to accelerate safe UAS integration and innovation, including freight deliveries

Appendix B. Freight System Policy Framework

This section provides an overview of policies that influence federal and state freight transportation decisions. Decisions regarding how and where to move freight (which transportation mode and gateway to utilize) is most often determined by the total cost. The private sector of the freight industry understands and plans for disruptions, both short and long-term, and the role that freight delays play in customer retention. While policies that increase the cost of doing business, or pose threats to reliability, play major roles in where and how the private sector of the freight industry invests and operates, it is important that economic aspects of freight do not contradict other policies such as environmental policies and public health policies.

Federal regulations significantly influence the cost of goods movement. Rules on truck driver hours of service (HOS), the requirement of using electronic logging devices (ELD) to monitor drivers' HOS, and Corporate Average Fuel Economy (CAFÉ) standards for heavy duty vehicles are examples. At the State level, California Labor Code rest and meal period requirements often misalign with federal HOS rules and result in more time away from home for truck drivers. Environmental laws, such as SB 375 and SB 100, while vital to protecting the state's environment, can potentially add costs to industry in terms of equipment replacement and uncertainty. The California Environmental Quality Act[1] can potentially add costs and time for expanding existing or building new logistics facilities in California. Regional and local policies can also influence the cost of shipping, such as the San Pedro Bay Ports[2] and Port of Oakland's Clean Truck Programs and PierPass[3], and South Coast Air Quality Management District's proposed logistics industry indirect source rules[4].

This section covers the latest regulations, statutes, and policies at all levels of government with a focus on what each one means for California. This section also highlights prior regional studies that influence freight planning in the State. The federal perspective summarizes California's role in moving the nation's goods, coordinating with neighboring states on major truck, rail, and pipeline corridors, and ensuring compliance with requirements for obtaining federal funding. The state perspective focuses on identifying freight-related or impactful policies and regulations established by all State agencies and areas of conflict. The discussion of regional and local context identifies freight-related policies, regulations, and planning efforts.

U.S. Department of Transportation (DOT)

Freight policy and regulation is primarily a function of the U.S. DOT. Within DOT, the FHWA provides much of the federal funding for infrastructure construction, operations, and maintenance for truck cargo. While FHWA focuses on building and maintaining the National Highway System (NHS) which is a public asset, the Federal Railroad Administration (FRA), Federal Aviation Administration (FAA), Maritime Administration (MARAD), and Pipeline and Hazardous Materials Safety Administration (PHMSA) each focus primarily on safety and security

associated with moving goods on privately-owned infrastructure. FRA's funding role is limited to projects that enhance safety, such as grade-separations of railroad/roadway at-grade crossings and positive train control (PTC). Similarly, FAA focuses on safe operations of air traffic, while MARAD focuses on security of maritime operations in our nation's ports and inland waterways.

Both the National Highway Traffic Safety Administration (NHTSA) and the Federal Motor Carrier Safety Administration (FMCSA) focus on equipment manufacturing and vehicle operations – which also play significant roles in the transportation of goods. The NHTSA primarily focuses on the total population of drivers and vehicles, while the FMCSA focuses on commercial vehicles. Funding for U.S. DOT agencies occur through multi-year bills passed by Congress and signed into law by the President. Each agency receives and allocates funding approved through these transportation bills to carry out their duties. The most recent transportation bills are described later in this section.

U.S. Department of Energy (DOE)

The U.S. DOE plays a role in freight as it relates to both transportation and site selection decisions for logistics facilities. In recent years, the Office of Energy Efficiency and Renewable Energy has become a major player in the strengthening of federal, state, and regional and local air quality rules and regulations, with an increasing focus on clean energy options. The U.S. DOE research, through its National Laboratories, assists original equipment manufacturers (OEM) with the development of cleaner vehicles, including heavy duty trucks. The U.S. DOE also supports the development of technologies to improve how electricity is created, stored, and used, in addition to development of disruptive technologies, including robotics, additive manufacturing, and artificial intelligence. California is fortunate to have four of the Nation's 17 laboratories. Federal funding bills allocate funding to U.S. DOE for investments in Research and Development, as well as aiding private industry with the purchase of cleaner equipment pursuant to air quality goals.

U.S. Department of Commerce (DOC)

The U.S. DOC promotes private investments in economic development through its Economic Development Administration (EDA). In 2018, the EDA programs focused on Regional Innovation Strategies (RIS) and University Center Economic Development. Whereas RIS provides funding for high-technology and innovation start- up companies to further research and development, the University Center's program focuses on training/retraining the workforce of tomorrow. The EDA grants have funded a significant amount of disaster recovery and business resiliency efforts over the past decade, including efforts from the aftermath of hurricanes Harvey and Irma.

U.S. Department of Labor (DOL)

The U.S. DOL provides information about jobs and labor, and it serves to regulate both employers and workers. The Bureau of Labor Statistics (BLS) provides information about where firms are located and how many workers they employ. Other U.S. DOL agencies are responsible for enforcing labor laws, such as labor hours and safety rules for warehouse, dock, and aviation workers. Truck driver hours of service (HOS) regulations are controlled by the FMCSA, a U.S. DOT agency; however, truck driver safety while picking up or dropping off cargo at a facility is regulated by DOL's Occupational Safety and Health Administration (OSHA). The U.S. DOL funds safety programs that address workplace hazards.

U.S. Environmental Protection Agency (EPA)

In recent decades, the U.S. DOT, the U.S. EPA, and the U.S. DOE have worked together to encourage the transition of equipment, both on-road and off-road, to cleaner, more fuel-efficient technologies. The U.S. EPA has worked closely with the logistics industry to encourage cleaner technologies through programs such as SmartWay[5]. SmartWay rewards and recognizes shippers that meet clean transport goals. Major participants include Target, Home Depot, Lowe's, Kroger, FedEx, and UPS. The overwhelming success of the program derives from both the recognition and funding that helps companies purchase cleaner, more expensive equipment.

Federal Deregulation (Trucking, Railroad, and Air)

Prior to the late 1970s, the federal government heavily regulated several aspects of the freight industry (trucking, rail, and air cargo), including rates charged and wages paid. By 1982, the entire transportation industry was deregulated, and by 1995, Congress enacted the Interstate Commerce Commission (ICC) Termination Act, which eliminated the ICC and established the Surface Transportation Board (STB). The railroads have been a focus of STB efforts, in that rail operations have no effective substitutes and needed to be regulated to avoid monopoly conditions. The STB replaced the ICC to regulate the movements of bulk commodities on railways, interstate waterways, international ports and waterways, and non-energy products moving by pipeline. The STB is charged with the responsibility of balancing the needs of shippers for fair and reasonable rates and service, with the railroads' need to return adequate revenues. This is important for understanding private rail freight financing and funding, and a public agency's ability to support and fund private rail improvements[6].

National Strategic Freight Plan (Draft, 2016)

A draft version of the National Freight Strategic Plan was released for public comment in early 2016, and the comment period closed on April 25, 2016. The plan has not been finalized[7]. The draft plan describes the freight transportation system, including major corridors and gateways, and assesses the physical, institutional, and financial barriers to improvement. The draft plan also highlights strategies to help support our freight transportation system through improved planning, dedicated funding streams, and innovative technologies.

National Multimodal Freight Network

In 2016, the National Highway Freight Network (NHFN) replaced the Primary Freight Network (PFN) and the National Freight Network[8]. The NHFN was established to strategically direct federal resources and policies toward improved performance on highways carrying higher amounts of freight. As part of the NHFN, critical connections to freight facilities, such as rail intermodal yards, seaports and airports, were added through two new designations, Critical Rural Freight Corridors (CRFC) and Critical Urban Freight Corridors (CUFC). States and MPOs are responsible for designating facilities within their jurisdictions pursuant to federally set mileage allocations for each state.

The Highway Trust Fund and Federal Transportation Bills

In 2017, Highway Trust Fund (HTF) tax revenue totaled just over $40 billion[9], and approximately 86 percent of this revenue was raised through federal excise tax on gasoline and diesel fuels. Historically, the federal transportation bills have been funded by the HTF; however, this has been changing. Unlike many other federal excise taxes, the fuel tax is a flat tax that is not indexed to inflation. The fuel tax was last raised in 1993 and remains at $0.184 and $0.244 per gallon for gasoline and diesel fuel, respectively. Since that time, inflation has risen nearly 70 percent and cars have become more fuel efficient. Starting in 2008, Congress began transferring General Fund dollars into the HTF to sustain highway funding, but funding still lags behind where it was in the 1990s. Less federal funding has resulted in lower federal funding shares in projects across the nation. Some states, such as California, have proactively developed and implemented state and local taxes to build and maintain infrastructure. In addition to changes in federal funding levels, federal funding has become more focused on projects of national significance, such as projects that improve the movement of goods. The following summary of transportation bills focuses on those that began to include freight components, from ISTEA through the FAST Act. Since the early 1990s, recognition of freight has been reflected in these policies, and most recently through funding allocations.

ISTEA (Intermodal Surface Transportation Efficiency Act, 1991)
Since the inception of the Federal Highway Administration, freight's importance has been recognized by the federal government. However, the first federal transportation bill to take an overall intermodal and multimodal approach occurred in 1991 with the passage of ISTEA, which linked highway, rail, air, and marine transportation and made funding available for projects that reduced congestion, improved air quality, and improved safety[10].

One of ISTEA's chief goals was to develop a "National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the nation to compete in the global economy, and will move people and goods in an energy-efficient manner."[11]

This bill also was the first to tie transportation improvements to air quality conformity in Regional Transportation Plans (RTP) and gave additional powers to MPOs. ISTEA did not include

set aside funding for freight projects, instead, ISTEA prioritized projects that supported intermodal transportation and high priority corridors many of which served freight. In California, ISTEA High Priority Corridors included the following:

- Corridor 16 (and 70), Economic Lifeline Corridor, I-15 and I-40 (California, Arizona and Nevada)
- Corridor 22, Alameda Corridor (POLA/ POLB to East Los Angeles)
- Corridor 30, I-5 (California, Oregon and Washington)
- Corridor 34, Alameda Corridor East (East Los Angeles to Barstow) and Southwest Passage (Coachella and San Bernardino to Arizona)
- Corridor 46, I-710 (POLB to SR-60)
- Corridor 69, Cross Valley Connector (I-5 to SR-14 in Santa Clarita Valley)
- Corridor 70 (and 16), Economic Lifeline Corridor, I-15 and I-40 (California, Arizona and Nevada)
- Corridor 71, High Desert Corridor (Los Angeles to Las Vegas)

The ISTEA provided more flexibility to states by reclassifying the highways with a focus on functional classification and establishing the NHS which brought greater focus to key state and local connectors that are vital to the nation's economy, defense, and mobility. The federal funding focus was altered through ISTEA, from major capital investments for new facilities to one of operations and maintenance. Lastly, the practice of public participation was instituted through ISTEA, and the Transportation Enhancement Program was established to fund community priorities, such as bikeways, historic and scenic preservation of byways, and environmental mitigation. Many of the planning principles that guide freight project planning and implementation as we know it today grew out of ISTEA.

TEA-21 (Transportation Equity Act of the 21st Century, 1998)

The TEA-21, a six-year omnibus funding bill for transportation, provided the first major funding for border crossings and trade corridors[12]. It also provided more funding for projects that increase America's competitiveness (port, intermodal, border crossing; also known as Projects of National and Regional Significance or PNRS).

In addition, TEA-21 provided the first funding for federal tracking and analysis of commodity flow data ($186M to Bureau of Transportation Statistics) and led to the Freight Analysis Framework (FAF) dataset that is still used by most states for freight planning and freight-related economic analyses. The TEA-21 continued the need for coordination with the U.S. EPA, as well as with MPOs. TEA-21 consolidated the 23 regional and statewide planning "factors" contained in ISTEA into seven broad "areas" that must be considered in RTPs, with a growing recognition of the importance of operations and maintenance:

- Support the economic vitality of the metropolitan planning area by enabling global competitiveness, productivity, and efficiency
- Increase the safety and security of the transportation system for motorized and non-motorized users
- Increase the accessibility and mobility options available to people and for freight

- Protect and enhance the environment, especially by promoting energy conservation and improving quality of life
- Integrate and connect the transportation system across and between various transportation modes to prioritize people and freight
- Promote efficient system management and operation
- Emphasize the efficient preservation of existing transportation systems

SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act – a Legacy for Users, 2005)

The SAFETEA-LU provided funding for highways, highway safety, and public transportation totaling $244.1 billion, and it built on the success of the prior two landmark bills that brought surface transportation into the 21st century—ISTEA and the TEA-21 [13]. The SAFETEA-LU refined the programmatic framework for investments needed to maintain and grow our transportation infrastructure. Specifically, SAFETEA-LU addressed safety, traffic congestion, efficiency in freight movement, intermodal connectivity, and environmental protection. It also laid the groundwork for addressing future challenges that were beginning to surface in international trade and urban delivery, notably e-commerce. SAFETEA-LU included provisions for innovative financing and public-private partnerships, as well as special funding for freight pilot projects such as truck parking studies.

Moving Ahead for Progress in the 21st Century (MAP-21)

On July 6, 2012, MAP–21 was signed into law[14]. The MAP-21 provided over $105 billion in funds for surface transportation programs to be used in fiscal years (FY) 2013 and 2014. This transformed the framework for investments in transportation infrastructure. MAP-21 created a streamlined and performance- based surface transportation program building on many of the highway, transit, bike, and pedestrian programs and policies established in 1991.

Sections 1117 and 1118 of MAP–21 directed the Secretary of Transportation to encourage each state to develop a comprehensive state freight plan outlining immediate and long-range plans for freight- related transportation investments. Section 1116 of MAP–21 authorized DOT to increase the federal share of project costs to 95 percent for a highway project on the US Interstate system, or 90 percent for a non- Interstate project if the project is certified by the Secretary of Transportation to make a demonstrable improvement in the efficiency of freight movement and is included in the state freight plan.

In October 2012, the U.S. Department of Transportation provided the required guidance on the freight planning process states must undertake to qualify for the freight prioritization provisions of Section 1116.

Fixing America's Surface Transportation (FAST) Act

The FAST Act of 2015 provided $305 billion over five years for transportation funding[15]. This bill was the first to establish a permanent federal discretionary formula funding program specifically for freight projects, as well as a competitive freight projects grant program. Specifically, FAST did the following:

- Established a National Multimodal Freight Policy
- Required the development of a National Freight Strategic Plan
- Created a freight-focused grant program of $4.5 billion over five years
- Established the National Highway Freight Program that provides $6.3 billion in formula funds over five years for states to invest in freight projects on the National Highway Freight Network. Up to 10 percent of these funds may be used for intermodal projects. Current projections of funding competitively available for all states to pursue are: $293M for 2017/18, $115M for 2018/19, and $127M for 2019/20 for a total 3-year funding amount of $535M[16].

The FAST Act focuses on infrastructure investments, operations and maintenance, safety, and environmental sustainability. More emphasis is placed on innovation and technological advancements that improve the efficiency of moving goods while minimizing environmental impacts of freight. In addition, this bill fosters and promotes interstate partnerships to address multi-state corridor planning and highway freight connectivity.

State Freight Policies and Plans

California has long been a leader in logistics and the movement of goods. The State understands how critical freight is to jobs and prosperity both within California and for the nation. California is home to the nation's largest container seaport, the San Pedro Bay Ports of Los Angeles and Long Beach, the largest agricultural production in the Central Valley, the largest logistics facilities cluster, and several of the largest population centers. California moves significant amounts of cargo on trains, planes, trucks – and more recently by automobiles, bicycles, pedestrians, and even robots. The following discusses the State's progress and policy experience and provides a launch point for the update of the State's Freight Mobility Plan.

California Freight Mobility Plan (2014)

The 2014 California Freight Mobility Plan (CFMP) was successful in establishing existing conditions, identifying funding, and sketching a roadmap for implementing plans and programs to improve the efficiency of freight transportation throughout California[17]. The plan focused on the following goals:

- Economic Competitiveness: Improve the contribution of the California freight transportation system to economic efficiency, productivity, and competitiveness
- Safety and Security: Improve the safety, security, and resilience of the freight transportation system
- Freight System Infrastructure Preservation: Improve the state of good repair of the freight transportation system
- Environmental Stewardship: Avoid and reduce adverse environmental and community impacts of the freight transportation system

- Congestion Relief: Reduce costs to users by minimizing congestion on the freight transportation system
- Innovative Technologies and Practices Use innovative technology and practices to operate, maintain, and optimize the efficiency of the freight transportation system while reducing environmental and community impacts

California Sustainable Freight Action Plan (2016)

The California Sustainable Freight Action Plan (CSFAP) was developed jointly by Caltrans, the California Air Resources Board (CARB), the California Energy Commission (CEC), and the Governor's Office of Business and Economic Development (GO-Biz) pursuant to the following two executive orders signed by the governor[18]:

- Governor's Executive Order B-32-15[19]
- Governor's Executive Order B-30-15 establishing a 2030 GHG emissions target of 40 percent below 1990 levels and requiring State agencies to incorporate climate change impacts into the State's Five-Year Infrastructure Plan

The key underpinning of the orders was the recognition that California continues to be a non-attainment area under federal air quality standards, and mobile sources in California are the primary contributors to the State's emissions problem. The CSFAP's guiding principles are as follows:

- Support local and regional efforts to improve trade facilities and corridors that achieve regional environmental, public health, transportation, and economic objectives consistent with statewide policy goals
- Grow the economic competitiveness of California's freight sector
- Grow the number of well-paying employment opportunities in the freight sector
- Reduce freight-related deaths and injuries, and security threats
- Reduce or eliminate health, safety, and quality of life impacts on communities that are disproportionately affected by operations at major freight corridors and facilities. This includes reducing toxic hot spots from freight sources and facilities and ensuring continued net reductions in regional freight pollution
- Improve the state-of-good-repair of the multi-modal freight transportation system
- Invest strategically to improve travel time reliability and to achieve sustainable congestion reduction on key bottlenecks on primary trade corridors
- Apply innovative and green technology, along with accompanying infrastructure and applicable practices, to optimize the efficiency of the freight transportation system
- Invest strategically to accelerate the transition to zero and near-zero emission equipment powered by renewable energy sources, including supportive infrastructure
- Improve system resilience by addressing infrastructure vulnerabilities associated with expected climate change impacts and natural disasters, which may include exploring opportunities to utilize natural systems to improve water quality, reduce ecosystem damage, prevent flooding, and create a cooling effect

- Site freight projects to avoid greenfield development by enhancing existing freight infrastructure or targeting infill development near compatible land uses

The CSFAP focuses on aligning the need to move goods with the needs to reduce emissions through provisions for cleaner technologies, especially on-road trucks and off-road cargo handling equipment. Understanding how difficult some of the mandates of the Plan would be for the freight industry to incur, $1 billion in funding was allocated to the industry for the procurement of cleaner goods movement technologies through Proposition 1B. The Plan also established air quality and efficiency targets for freight, including the following:

- System Efficiency – 25 percent efficiency by increasing the value of goods and services produced from the freight sector relative to the amount of its produced carbon
- Transition to ZE Technology – deploy over 100,000 ZE and near-ZE freight vehicles and CHE powered by renewable energy by 2030

The CSFAP additionally acknowledged the potential impact on businesses and included a policy aimed at increasing competitiveness and economic growth by developing key performance metrics for measuring economic competitiveness through collaboration with economists and industry experts. In addition, the Plan outlined potential freight funding sources to implement the Plan, including federal funding, State SB 1 ($0.12 gas tax) freight funding allocation, and Cap and Trade. Furthermore, the Plan developed an approach to fund ongoing freight investments by the below:

- Prioritizing projects
- Building upon existing infrastructure
- Investing in sustainable communities (clean air initiatives related to goods movement)
- Investing in fueling infrastructure of the future
- Eliminating/reducing congestion/freight bottlenecks

Lastly, the CSFAP established a Call for Pilot Projects focused on cleaner technologies and operational innovations.

State Rail Plan (2018)

The 2018 State Rail Plan (Rail Plan) was developed pursuant to the federal Passenger Rail Investment and Improvement Act (PRIIA 2008) and state legislature AB 528 (2013). The Rail Plan establishes a statewide vision of an integrated rail system[20], and describes a policy framework for working with, and guiding public and private investments that enhance freight movement while providing co-benefits with passenger services. The integrated vision is dependent on more efficient utilization of the existing rail system, expanding the coverage and mix of rail services in several corridors, scaling services to meet market demand, and facilitating network coordination through scheduling. For freight movements, this integrated system means better system reliability and a clear pathway to growing capacity. Improvements in rail freight reliability result in the form of economic benefits that reverberate locally, regionally, and nationally. By improving rail infrastructure to attract additional long-distance freight

movement, extra capacity is created on highways for passengers and short-distance freight travel. The improvements identified in the Rail Plan are designed to either preserve rail freight capacity, or to provide for rail freight enhancements in certain high traffic corridors, particularly intercontinental trade corridors that provide rail connections to ports. The improvements are categorized in six major areas of need and opportunity:

- Trade corridor improvements
- Economic development and short lines
- Grade-crossing improvements
- Additional terminal and yard capacity
- Short-haul rail improvements
- Advancement of zero- and near-zero- emissions technologies

Rail is an effective mechanism for congestion relief by diverting truck trips which can reduce congestion contributing to emissions reductions and improve safety on the roadway networks. Rail investments can make a region more economically competitive, attracting development from other regions.

Integrated Energy Policy Report

The California Energy Commission's (CEC) 2017 Integrated Energy Policy Report covers a broad range of topics, including implementation of SB 350, integrated resource planning, distributed energy resources, transportation electrification, solutions to increase resiliency in the electricity sector, energy efficiency, transportation electrification, barriers faced by disadvantaged communities, demand response, transmission and landscape-scale planning, the California Energy Demand Preliminary Forecast, the preliminary transportation energy demand forecast, renewable gas (in response to SB 1383), updates on Southern California electricity reliability, natural gas outlook, and climate adaptation and resiliency. The CEC is anticipating that more than 25 percent of heavy-duty trucks will be electric-diesel hybrids by 2030. This report also provides extensive information about natural gas pipeline infrastructure and the ability to fuel transportation with our existing assets.

Safeguarding California: Reducing Climate Risk Update (2017)

The California Natural Resources Agency's Climate Adaptation Strategy identifies vulnerabilities throughout California and identifies strategies to mitigate them[21]. Climate change impacts from sea-level rise, storm surge, and coastal erosion have been identified as imminent threats to highways, roads, bridge supports, airports at or near sea level, seaports, and some transit system and rail lines. Shifting precipitation patterns, higher temperatures, wildfire, and an increased frequency of extreme weather events threaten transportation assets at varying locations across the state.

Temperature extremes and increased precipitation can increase the risk of road and railroad track failure, decrease transportation safety, and create higher maintenance costs. As climate

changes occur over time, the choices for the State and all the transportation partners are to build protection against the threat (defend), redesign the infrastructure (accommodate), or abandon and relocate (retreat). The economic cost associated with such fortification, alteration, or relocation of existing infrastructure has yet to be fully estimated but is it likely to be billions of dollars. Impending climate impacts have implications not only for the siting of new transportation infrastructure, but also maintenance and operation, design features of transportation systems, and emergency planning and response for extreme climate events.

California Transportation Plan 2040

The California Transportation Plan 2040 (CTP) is California's long-range transportation plan and is currently in the process of being updated[22]. Pursuant to California Government Code (GC) §65073.2, the CTP defines the statewide multimodal transportation system that is necessary to meet GHG emissions targets to obtain 1990 levels by 2020 and 80 percent below the 1990 levels by 2050. To meet these goals, GC §65071 requires Caltrans to update the CTP every five years. The CTP 2040 is an umbrella plan that integrates Caltrans' modal plans into a statewide multimodal transportation vision. The CTP 2040 offers a detailed overview of the existing transportation network and assesses future transportation trends and challenges. The CTP offers strategies that improve mobility and accessibility across all modes, contribute to system preservation, support a vibrant economy, improve public safety and security, promote livable communities and social equity, and support environmental stewardship.

Caltrans Strategic Management Plan 2015-2020

The Strategic Management Plan shifted Caltrans from a capacity-building to a fix-it-first mentality, focusing in on improving system operations, achieving greater efficiency, and eliminating the backlog of maintenance projects[23]. The Plan provides a roadmap for Caltrans by defining its role, setting expectations, and focusing on operations. The Plan proposes several performance measures and targets that are in line with the Departments five goals, which are:

1. Safety and Health
2. Stewardship and Efficiency
3. Sustainability, Livability, and Economy
4. System Performance
5. Organizational Excellence

Caltrans Interregional Transportation Strategic Plan (ITSP) 2015

The ITSP provides guidance for the identification and prioritization of interregional transportation improvements[24]. Projects identified are eligible for Interregional Transportation Improvement Program (ITIP) funding. The 2015 ITSP expanded the analysis from focusing on ITIP investment in interregional highways and intercity rail to analyzing the entire interregional transportation system regardless of funding source. The purpose of the ITSP is to be a guiding document for all investment in the interregional transportation system.

2020-2024 Strategic Highway Safety Plan

The Strategic Highway Safety Plan (SHSP) is a statewide, coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and severe injuries on all public roads[25]. It identifies key safety needs and guides investment decisions towards strategies and countermeasures with the most potential to save lives and prevent injuries. This document relies on data to identify problems and develop solutions. California adopted the following measurable objective for the SHSP:

- Establish a trend towards zero fatalities and serious injuries by 2050

The first SHSP was required by the Safe, Accountable, Flexible, Efficient Transportation Equity Act-A Legacy for Users (SAFETEA-LU) in 2005 and the FAST Act made the SHSP a permanent program. The current SHSP spans 2020-2024 and was developed with the involvement 101 stakeholders from both the private and public sectors that represented the 5 E's of traffic safety - Engineering, Enforcement, Education, Emergency Response, and Emerging Technologies. SHSP Executive Leadership and a 16-member Steering Committee provided oversight. The SHSP includes 16 "Challenge Areas", or areas on which the plan focuses efforts, and proposes strategies and strategic action items to address those challenge areas. The next SHSP in under development and will span from 2025-2029.

Recent State Legislation Related to Freight

This section highlights numerous recent State legislations but is not all encompassing. There are various recent legislations that have had a direct and indirect impact on freight.

Trade Corridor Enhancement Program (TCEP) 2018

SB 1 TCEP Provisions

SB 1 created the Road Maintenance and Rehabilitation Program to address deferred maintenance on state and local roadway systems throughout the state through a combination of fuel taxes and license and registration fees[26]. SB1 increased State gas tax by $0.12 per gallon for gasoline and $0.20 per gallon for diesel fuel and included an inflation adjustment factor. The bill increased vehicle license fees by $25 to a maximum of $175 and adjusts for inflation. Recognizing that the State is aiming for more EV registrations, the bill also created a new $100 increase in vehicle license fees for zero-emission vehicles starting in 2020 with an inflation adjustment factor. SB1 provides an annual set-aside of $200 million for self-help counties, defined as counties with adopted transportation sales tax measures and/or established development impact fee programs. 50 percent of the revenue generated by the $0.20 per gallon diesel fuel tax will be deposited into the newly created Trade Corridor Enhancement Program to expend on corridor-based freight projects resulting in an estimated 10-year funding of $3 billion. Furthermore, SB1 created a $30 million annual Advanced Mitigation Program to protect natural resources and accelerate project delivery.

SB 103 TCEP Provisions
SB 103 deleted references to the Trade Corridor Infrastructure Fund (TCIF), revised the TCIF requirements, and applied the revised TCIF requirements to the Trade Corridor Enhancement Program[27]. SB 103 also mandates the California Transportation Commission (CTC) to allocate 60 percent of the available funds to projects nominated by regional transportation agencies and local agencies with the remaining 40 percent to be allocated to projects nominated by Caltrans.

Senate Bill 1: Solutions for Congested Corridors Program (SCCP)
SB 1 created the SCCP which continuously provides $250 million annually for projects that improve highly congested and traveled corridors throughout the state. For projects to be eligible for SCCP funding, the regional transportation planning agency or other eligible agency must have a Comprehensive Multimodal Corridor Plan. The CTC selects these projects based on their ability to balance transportation, environmental, and community access needs through the promotion of a holistic and multimodal approach. On December 5, 2018, the CTC adopted the 2018 Comprehensive Multimodal Corridor Plan Guidelines. The improvements must consider the movement of people and goods on all modes, and improvements are not limited to state highways, but rather, may also be on local streets and roads, public transit and rail facilities, cycling and pedestrian facilities, required mitigation and restoration, or some combination of solutions.

Pursuant to Streets and Highways Code (SHC), a comprehensive multimodal corridor plan must be submitted at the time of the project funding application. CTC will review and approve projects pursuant to the following criteria:

- Congestion reduction in highly traveled corridors by providing more transportation choices for residents, commuters, and visitors to the area of the corridor while preserving the character of the local community and creating opportunities for neighborhood enhancement projects. [SHC 2391]
- Reflects a comprehensive approach to addressing congestion and quality-of-life issues within the affected corridor through investment in transportation and related environmental solutions. [SHC 2392]
- Developed in collaboration with state, regional, and local partners. [SHC 2392]
- Evaluated the following criteria as applicable [SHC 2394]
    - Safety
    - Congestion
    - Accessibility
    - Economic Development and Job Creation and Retention
    - Air Quality and Greenhouse Gas Emissions Reduction
    - Efficient Land Use
- Consistent with the goals and objectives of the Regional Transportation Plan [SHC 2393].

Assembly Bill 32 (AB 32)

AB 32, the "California Global Warming Solutions Act of 2006," created the Cap-and-Trade Program, which requires California to reduce its GHG emissions to 1990 levels by 2020—a reduction of approximately 15 percent below emissions expected under a "business as usual" scenario. In addition, SB 862 established a long-term funding plan for portions of Cap-and-Trade Program money, including a continuous appropriation of 25 percent of the funds to the California High-Speed Rail project and 10 percent to the Transit and Intercity Rail Capital Program. In 2017, Assembly Bill 398 extended the Cap and Trade Program through 2030.

Assembly Bill 133 (Weber, 2016)

This bill provided transfer of $11M to the Trade Corridor Improvements Fund (TCIF), a program initially implemented and funded by Proposition 1B. The TCIF funds can be used directly or indirectly to improve freight movement in key corridors.

Senate Bill 350 (de Leon, 2015)

On October 7, 2015, the California State Senate passed Senate Bill 350: Clean Energy and Pollution Reduction Act into law[28]. SB 350 established California's 2030 greenhouse gas reduction target of 40 percent below 1990 levels. To achieve this goal, SB 350 sets ambitious 2030 targets for energy efficiency and renewable electricity, among other actions aimed at reducing greenhouse gas emissions across the energy and transportation sectors.

Senate Bill 743 (D. Steinberg, 2013)[29]

Signed in 2013, SB743 has the intent to "more appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions." When implemented, "traffic congestion shall not be considered a significant impact on the environment" within California Environmental Quality Act (CEQA) transportation analysis.

SB 743 requires the Governor's Office of Planning and Research (OPR) to identify new metrics for identifying and mitigating transportation impacts within CEQA. For land use projects, OPR identified Vehicle Miles Traveled (VMT) per capita, VMT per employee, and net VMT as new metrics for transportation analysis. For transportation projects, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate transportation impacts.

Regulatory changes to the CEQA Guidelines that implement SB 743 were approved on December 28, 2018. July 1, 2020 is the statewide implementation date and agencies may opt-in use of new metrics prior to that date.

Regional Freight Policies and Plans

Caltrans Districts Freight Plans

District 3 Goods Movement Study (2015)
This study includes a comprehensive list of freight flows by all modes moving in and through the Sacramento region, an evaluation of projects on the State Highway System and intermodal connectors, and recommends strategies for addressing congestion, safety, efficiency, and ongoing operations and maintenance concerns. The study provides an overview of funding mechanisms and recommendations for prioritization and implementation.

District 9: Eastern Sierra Corridor Sustainable Freight Strategies Study (2019)
The Eastern Sierra Corridor Sustainable Freight Strategies Study, completed in 2019, is taking a fresh look at issues along U.S. 395 generally between I-40 on the south and I-80 on the north. Key issues included identifying and addressing truck parking shortages, as well as operational improvements for trucks.

District 9: Goods Movement Study for US 395 Corridor (2006)
Caltrans District 9 commissioned this study to investigate truck traffic origins and destinations on U.S. 395. The study involved paper surveys and interviews of truck drivers along the corridor to gain a better understanding of why trucks use U.S. 395, and to also understand how the drivers feel about the conditions of the roads and to seek comments and input. The Eastern Sierra Corridor Sustainable Freight Strategies Study provided an update to this effort.

Regional/County Freight Plans

California-Baja California Border Master Plan (2014)
The California-Baja California Border Master Plan, completed in 2014, was a bi-national effort to coordinate planning and delivery of projects at land port of entries and the transportation infrastructure serving them. The primary objectives of the California-Baja California Border Master Plan were to increase the understanding of Port of Entry (POE) and transportation planning on both sides of the border and create a plan for prioritizing and advancing POE and related transportation projects.

Based on the outcomes of this pilot bi-national planning process, the California-Baja California approach could be expanded to other border states and customized to address their needs, resulting in a master planning process for the entire U.S.-Mexico border.

Regional Transportation Plans (RTP), Goods Movement Sections
There are 18 MPOs and 26 RTPAs in California that are responsible for developing Regional Transportation Plans (RTP) for their respective areas. Pursuant to federal and state statutes and regulations, each RTP must address goods movement. The RTP guidelines list 11 items that must be addressed in the RTPs for both MPOs and RTPAs. As stated in the RTPA RTP Guidelines:

> "RTPAs must plan for the goods movement infrastructure in the same way they plan the transportation infrastructure for the movement of people to support projected population growth and economic development[30]."

The most urban regions began preparing goods movement plans in the mid-2000s, such as SCAG and MTC. All the current RTPs for the MPOs and RTPAs include a list of freight projects, programs, and needs. These projects are incorporated into the CFMP. In addition to the regional transportation plans, regional planning agencies have commissioned the following freight plans:

Alameda County Goods Movement Plan (2016)
This countywide goods movement plan, a first for Alameda County, took a holistic view of freight from an industry and a neighborhood perspective[31]. The plan stemmed from the MTC Goods Movement Plan, but locally, this plan focused on congestion, truck parking, air quality, and conflicting land uses, whereas regionally and nationally, it focused on rail and road connections. The Plan identified performance measures, analyzed existing and future conditions, identified needs, and provided a comprehensive strategy for funding the County's freight infrastructure needs.

US 101 Central Coast California Freight Strategy
This study of US 101 from San Benito County to the North to Santa Barbara County to the south includes a set of freight performance metrics and weights to prioritize funding for projects, identifies projects that will improve the movement of goods along US 101 and key connecting routes, and established strategies for implementation. This plan set a precedent for interregional cooperation on freight planning and provided a path forward for lobbying on freight issues to capture its fair share of freight funding.

I-5/SR 99 Freight Corridor Study (2017) / Central Valley Sustainable Goods Movement Study (2017)
These two studies analyze goods movement in the Central Valley. The I-5/SR 99 study covered the 200-mile stretch of the I-5 and SR 99 corridors from the southern limit of Kern County to the northern limit of San Joaquin County in the Central Valley. This study identified freight and logistics clusters and the origins/destinations of a sample of trucks stopping at these freight clusters. This information was used to identify truck patterns in the region and correlate them with truck-involved crashes, speeds, and congestion along the corridors to guide the development and implementation of strategies to improve truck flows and travel time reliability. Closely related and prepared during the same timeframe using some of the same data sources, the Central Valley Sustainable Goods Movement Action Plan focused on first- and last-mile connectors to freight clusters and investigated potential Critical Rural Freight Corridors (CRFC).

Goods Movement Border Crossing Study (SANDAG, 2012)
This study focused on the inter-relatedness of the U.S. and Mexican economies along California's southern border[32]. The purpose of this study was to focus on identifying

infrastructure improvements that would improve logistics and create economic benefits. The study identified the importance of the SCAG and SANDAG regions to the Mexicali, Mexico region, and vice-versa through a high-level characterization of the supply chains for large, multinational firms that heavily rely on cross-border transportation.

On the Move, Southern California Delivers the Goods (2012) /Multi-County Goods Movement Action Plan (MCGMAP) (SCAG, 2004)

In 2004, Los Angeles County Metropolitan Transportation Authority (LA Metro) spearheaded the development of MCGMAP, which consisted of LA Metro, Orange County Transportation Authority (OCTA), Riverside County Transportation Commission (RCTC), San Bernardino Associated Governments (SANBAG), San Diego Association of Governments (SANDAG), Ventura County Transportation Commission (VCTC), Southern California Association of Governments (SCAG), and Caltrans Districts 7, 8, 11, and 12. MCGMAP was the master plan for goods movement in Southern California that guided preparation of state, regional, and local transportation plans. The objective of the MCGMAP was to develop strategies and projects that: 1) address the goods movement infrastructure capacity needs of the region; 2) reduce goods movement emissions to help achieve air quality goals; and 3) improve the quality of life and community livability for Southern California residents[33].

The strong collaboration within the entire SCAG region resulted in Southern California obtaining more than 50 percent of the Proposition 1B TCIF dollars, which it was then able to leverage for federal funding. The collaborative was unified in its messaging under this process when traveling to Sacramento and Washington, D.C. in search of funding.

In 2012, SCAG updated MCGMAP with new information, including an updated cargo forecast from the San Pedro Bay Ports, updated industrial warehouse demand and capacity estimates, and the latest environmental policies, programs and strategies for addressing the impacts of goods movement in the region[34]. SCAG incorporated recommendations from this study into the 2012 RTP/SCS.

Los Angeles County Strategic Goods Movement Arterial Plan (CSTAN, 2015)

The CSTAN is a planning tool that is intended to accomplish six goals:

1. Identify truck arterial system needs and connectivity gaps
2. Prioritize funding to projects showing the greatest expected benefits
3. Minimize truck and pedestrian/bicycle conflicts
4. Establish a database of arterial truck data that can be used by industry as well as for planning purposes
5. Assist the trucking industry in identifying designated truck routes
6. Support the development of the Federal PFN

LA Metro is currently updating their freight plan. LA Metro expects to complete the plan by 2020.

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Appendix C. California's Competitive Position

California's competitiveness is vital to both public agencies and private stakeholders. Losses of commerce, businesses, and jobs to other states or nations are keenly felt throughout the state and across sectors. Increasing statewide competitiveness is a key priority for the State; this section connects the role, and potential growth, of efficient goods movement in California's competitiveness and achieving this goal.

Losses of economic activity due to interstate and international competition vary in scope and effect. Losses are highly visible and tangible when businesses move away from California or when businesses that might have located in California choose a competing location instead. Other economic losses are less obvious or immediate, such as gradual shifts in business activity away from California or closures of California businesses. Yet, these less obvious losses can be equally important to California's aggregate economy and affect some communities disproportionately. Increasing competitiveness across the state can contribute to local and state economic development by making California the preferred choice of developers, businesses, and transportation providers.

"Competitiveness" is often defined in general terms but is typically grounded in economic activity and attraction. Key definitions of "competitiveness" are included below:

- "A competitive region is one that can attract and maintain successful firms and maintain or increase standards of living for the region's inhabitants. Skilled labor and investment gravitate away from 'uncompetitive' regions towards more competitive ones."[1]
- "Competitive regions provide conditions under which companies can compete successfully on national and international markets while paying wages that can support a high standard of living to citizens."[2]

Few discussions of competitiveness specify over what states are competing for, which business entities or sectors are competing, or how freight transportation affects winning or losing. There are few available comparisons of freight transportation performance between regions, states, or nations. This chapter serves to address the nature of competition between locations and the role of goods movement in that competition.

The state and its communities, transportation providers, and businesses compete in several ways:

- The State of California and California municipalities compete for business locations, including production facilities, distribution centers, and offices.
- California producers, manufacturers, distributors, and wholesalers compete for business and market share with their domestic and foreign counterparts elsewhere and may also compete for business within their own firms.
- California seaports, airports, and freight carriers compete with their counterparts in other states and nations for freight transportation business.

This section examines these different types of competition and the factors that affect California's competitive position in each.

The role of freight transportation in economic competitiveness is usually assumed to be a function of freight system capacity, performance, and efficiency. In most discussions of competitiveness, quantitative or qualitative shortfalls in freight capacity, cost, service frequency, transit time, reliability, safety, etc. are presumed to diminish economic competitiveness.

Beyond freight transportation costs and services, California's competitiveness is affected by several factors cited in the industry focus groups conducted for the CFMP 2020. These factors include:

- **Workforce availability and cost of living--** Production and distribution facilities have reported difficulty in obtaining qualified workers and truck drivers in California. California's cost of living, particularly housing costs, makes it difficult for workers to make ends meet on typical wages.
- **Land and development costs and uncertainty--** The difficulty and cost of securing land and developing facilities in California are frequently cited as handicaps in California's competitiveness. The length and uncertainty of the development approval process contribute to this problem.
- **Environmental regulations--** California's environmental regulations, and the cost of compliance, are frequently cited as decreasing the state's competitiveness. Uncertainty over future regulations is also a significant factor.
- **Lack of linkage between goods movement and economic development efforts--** Stakeholders feel that California's economic development efforts lag behind other states and are not effectively linked to the goods movement industry or its capabilities.

This section provides a high-level perspective on the potential role of goods movement in California's national and international competitiveness and identifies factors that may be of concern to non-transportation agencies. The section addresses the following subjects:

- Competition for:
    - Business locations
    - California products and production
    - Distribution centers
    - Seaport business
    - Air cargo business
- Cost differences in:
    - Freight transportation
    - Labor and supply
    - Land
    - Energy and utilities
- Perceptions of California's business climate

- Competitive economic development efforts
- Implications for competitiveness and potential growth

Competition for Business Locations

The focus of most regional and state competitiveness discussions is competition for locations of new production, distribution, or transportation facilities. These facilities generate jobs, tax revenue, and positive economic impacts within communities. Californians are concerned over the potential loss of businesses, and over facilities that close due to out-of-state competition or relocate to outside of the state. For this discussion, it is critical to first understand how companies are making various location decisions.

Types of location decisions-- Although there are many possible variations and combinations, most location decisions fall under a few basic types:

- Choosing a location for a new production or distribution facility
- Choosing whether to expand, contract or close an existing location
- Choosing how much production or distribution activity to allocate among locations

Location Decision Factors-- Key factors in location decisions commonly include:

- Access to target markets
- Availability of suitable sites, buildings, or other facilities, with appropriate zoning
- Fit within existing or planned production, supply chain, and distribution networks
- Development timeline (e.g. permitting, construction, EIRs)
- Land cost and zoning
- Cost of doing business (other than transportation)
- Local regulations and other restrictions
- Workforce availability
- Proximity to suppliers, intellectual capital, and other inputs
- Freight transportation capacity and reliability
- Freight transportation service and cost

California's consumer population and direct access to international markets via ports on the Pacific Rim give the state a competitive edge to the first factor- access to target markets. Few businesses have a major presence in the California market without a physical location in California.

Some of these factors, such as site availability and access to inputs, can eliminate a given location from further consideration. If there are no suitable sites available or if critical inputs cannot be obtained, other factors do not matter. Similarly, if freight transportation capacity and reliability needs cannot meet in a given location, the business will locate elsewhere.

While freight transportation capacity (e.g. highway, port, rail, or air cargo capacity) can usually be taken for granted, this is not always the case. Facilities that require or produce large volumes of marine bulk cargo (e.g. export grain elevators) or specialized cargo (e.g. import autos) need specialized terminals with sufficient capacity. Reliability can usually be achieved, but sometimes at a higher cost. If fleet operators must add drivers, add equipment, or allow extra time to overcome local problems, then costs can increase significantly. Notably, some parts of rural California have limited STAA truck access, which can reduce the ability of those areas to compete for new facilities.

While cost differences are relatively easy to quantify, reliability differences are not. There is a relationship between reliability and inventory levels (e.g., the need for larger or smaller "safety" stocks), but in most cases, the greater concern is the ability to meet corporate and customer requirements consistently. Recurrent congestion reduces productivity and can affect reliability if the parties cannot anticipate and accommodate expected delays.

Non-recurrent delays and congestion are a more serious reliability problem. As California transportation facilities of all kinds – highways, arterials, ports, airports, railroads – operate closer to their capacity, the frequency and severity of non-recurrent congestion tend to rise. In some parts of California, notably the San Francisco Bay Area, usable corridors are restricted by geography. Often, there are no practical alternatives to congested routes.

Manufacturing plants may have flexibility in their location decision, either within California or in other states. Manufacturing plants that use easy-to-transport inputs (e.g. electrical components) or widely available inputs (e.g. paper or basic metals) may take the full list of location factors above into account. If all other factors are equal, goods movement may become the deciding factor. However, the ability of the facility to locate in a wide variety of locations implies that either goods movement differences are not likely to be critical, or that there are few significant goods movement differences between locations.

Where more generic inputs such as semi-skilled labor, space, or electrical power are a major part of production expenses, the costs of those inputs will have a greater impact on location decisions. In this case, California's higher labor, land, or power costs – or perceptions of higher costs – may place the state at a competitive disadvantage. These perceptions are discussed further in the Perceptions of California's Business Climate section of this section.

Local Market Facilities-- Many goods movement and freight-dependent industry facilities must be located close to the market that they serve or the sources on which they rely. California does not need to compete for these local market facilities, although there may be competition between cities and counties within California. For example:

- Suppliers of basic building materials (aggregates, cement, lumber) need to be close to construction projects. Consequently, these facilities are spread widely throughout the state.
- Processors of perishable inputs (wine grapes, tomatoes, strawberries) need to be close to the source to maintain quality without excess transport and handling costs.

- Suppliers of inputs to true "just in time" manufacturing (e.g. auto assembly plants) must be located close to their customers to maintain the required responsiveness.
- Facilities that require specific work force skills (e.g. high-tech product development, software engineering) usually located near sources for those skills (e.g. major universities) or other facilities that need those skills (e.g. Silicon Valley).

These local market examples are cases where California does not need to compete for the production or distribution function. Cement batch plants, for example, are distributed throughout the state to serve local markets, and cannot serve California cities from other states. Likewise, sand and gravel producers – quarries, etc. – cannot locate away from the underlying resource. In general, fungible commodities with high transportation costs relative to their value cannot be shipped very far and still compete with nearer suppliers.

Competition for California Products and Producers

California producers and their products compete with producers and products from other states and nations. The extent and nature of that competition depend on commodity type. For example, some California products are differentiated by source or brand, such as Napa Valley wines, California raisins, or Tesla autos. Since customers may not see wines, raisins, or autos from elsewhere as perfect substitutes, differentiated products can often command a somewhat higher price and have a greater ability to absorb transportation cost differences without losing market share. Other California products dominate their industry due to production volume and are somewhat shielded from competition because other sources cannot satisfy the market demand. However, California products that are not differentiated by source or brand must compete on delivered price and reliability of supply. Examples discussed below to illustrate the differences in competition between products and markets.

Medium-grain rice
California medium-grain rice is an example of a product that is slightly differentiated but must also compete on delivered price. Medium-grain rice produced in and milled in California (e.g. Sutter County), for example, must compete in domestic and foreign (Asian) markets with medium-grain rice of equivalent grades from elsewhere in the U.S. or from other countries. Medium-grain rice generally competes with other types of rice, including long-grain and basmati rice, also produced in California and elsewhere. Within the U.S., Arkansas is the leading rice production state and is a competitor to California's rice industry. Some California rice varieties, such as the Calrose variety, and its commercial descendants, are favored for their texture in sushi and other Asian cuisines, and therefore can command a somewhat higher price in those markets.

Within the medium-grain rice export production and shipping process, freight transportation efficiency would affect:

- Transportation of rice seed, fertilizer, and equipment to fields
- Transportation of harvested rice to rice mills

- Transportation of milled rice in bags or bulk to seaports
- Transportation of rice by ship to foreign markets

Medium-grain rice growers in one part of California (e.g. Sutter County) may compete with growers in other areas (e.g. Glenn and Butte Counties). If growers in both areas receive the same delivered price at the mill, the grower with the lower trucking cost will have higher net revenue. The difference in total trucking cost is likely to be small, however, and the difference in trucking efficiency (e.g. cost per mile) within California is likely to be smaller yet.

The delivered cost of California medium-grain rice in Hong Kong would include:

- California production, milling, and distribution costs
- Trucking costs in California
- Shipping costs (including port costs) from California to Hong Kong
- Distribution and delivery cost in Hong Kong

Due to the short distances involved, internal California transportation costs would have a relatively minor role in the delivered cost of California medium-grain rice and its competitiveness in world markets. For a given and competitively determined delivered price in Hong Kong, the rice wholesaler or broker will realize a greater net profit if transportation costs are lower.

Within California, there may be competition for the location of new rice milling or storage facilities. That location may be influenced by the condition of local roads and access to rail service, but it is more likely to be determined by land costs and distance to growers and ports.

Almonds

California almond production is shielded from domestic and foreign competition, due to both sheer production volume and product differentiation. In 2016, California produced about 80 percent of the world's almonds and 100% of the U.S. commercial supply. California also produced about 65 percent of the world's almond exports to more than 90 countries worldwide.[3] As a result, California almonds face very little competition.

Depending on market conditions, higher transportation costs will either raise the delivered cost or reduce the producer's profit. In the case of almonds, California dominates world trade. If foreign consumers want more almonds than are available locally, they must pay California prices. The risk to California almond producers is that foreign consumers will buy fewer almonds if prices become too high or if the delivery becomes unreliable.

For almonds, California goods movement efficiency would have a little competitive impact. The almond industry cannot readily move to another state, nor can other producers quickly increase production to displace California almonds.

Competition for Distribution Centers

Distribution centers (DCs) can be national (NDCs), serving the entire nation, regional (RDCs, serving a region within the nation), or local in scope. There may also be separate import distribution centers (IDCs), handling imported goods separately from domestic goods. A state or a sub-region may compete as a potential location for a national, regional, or import DC. RDCs in the state may also "compete" for coverage with RDCs in other states.

Large retail chains, manufacturers, and wholesalers may adopt one of several distribution center strategies to access their customers:

- A single national distribution center (NDC)
- A series of regional DCs (RDCs)
- A tiered system of an NDC feeding multiple RDCs

Firms may progress through different strategies:

- Starting with a single NDC, often at the point of production or near a port
- Establishing additional RDCs as a volume in regional markets grows
- Establishing additional IDCs as import volumes justify multiple entry ports

Large, well-known retail chains typically have multiple RDCs. For example, the following retail chains have RDCs in California:

- Target – Woodland, Rialto, Shafter
- Home Depot – Lathrop, Mira Loma
- Crate & Barrel – Tracy, Santa Fe Springs
- Rite Aid – Woodland, Lancaster
- Safeway – Tracy, Santa Fe Springs, Norwalk
- J.C. Penney – Stockton
- Walmart – Porterville, Mira Loma
- IKEA – Lebec
- Kohl's – Patterson, San Bernardino

California is such a large market that it is unlikely that a major retail business would serve the state without at least one RDC there. As noted, many DCs are already here. However, the activity level of California's DCs may be subject to "competition" within the supply chain of various types:

- **Competition for existing territory** – how much of California, or the western states, will be served from California DCs, as opposed to DCs elsewhere?
- **Competition for expansion** – will the firm choose to expand stores or sales in the state, thus increasing volume at the state DC, or elsewhere?

- **Competition for the new territory** – as a producer, importer, or retail chain expands into new markets, will those markets be served from California DCs, from existing DCs elsewhere, or from new DCs elsewhere?

For example, an importer with growing volume at a single Inland Empire facility might choose: 1) to expand that facility and continue to serve the whole country from a single point; or 2) to establish a second import facility in Georgia, served by the Port of Savannah. In the first case, California lost a second facility and all the additional jobs and tax revenue from that decision, but in the second case, the state loses volume, expansion potential, jobs, and tax revenue.

In this type of planning, the importer must weigh the total cost of serving a mid-continent market (Kansas City, for example) from the Inland Empire versus from Georgia. The relevant costs would include:

- Ocean transportation costs from the source to the U.S. port
- Inland transportation (truck) to the port-area DC
- Inland transportation to the store or customer in Kansas City

Port handling costs do not figure directly into the importer's calculations, because those costs are part of the ocean transportation expense. However, the importer may see additional clean trucks and PierPass/Off Peak fees at Southern California ports.

In the example above, the importer may pay for truck drayage between the port and the DC, and between the DC and an intermodal rail terminal for the trip to Kansas City.

California ports "compete" for this business but have no direct influence over the costs and services involved, except for their own fees.

CFMP outreach and interviews with importers and other parties revealed that transportation cost is only one factor in the DC location decision, and perhaps not the deciding factor. Many stakeholders regard it as significantly more difficult, more time consuming, costlier, and less certain to build or expand a facility in California than elsewhere. This perception – whether it is true or not in every case – tends to tip the scale in favor of locations in other states. Other consequences and effects of perceptions are discussed further in the Perceptions of California's Business Climate section.

Competition for California Seaport Business

While there has been much commentary on the efficiency of U.S. and West Coast ports compared to leading Asian and European ports, a realistic view of the role of ports in state competitiveness is much narrower.

California has 12 deep water port complexes, each specializing in a different mix of major cargo types, commodities, and service territories:

- The Ports of Los Angeles, Long Beach, and Oakland are best known as container ports, but the San Pedro Bay ports also handle autos, break-bulk cargo, dry bulks, and liquid bulks (chiefly petroleum and petroleum products)
- The Port of Hueneme handles fresh fruit in refrigerated containers and autos
- The Port of Richmond handles autos, vegetable oils, and break-bulk cargo
- The Port of Benicia handles autos
- The Port of Redwood City handles bulk commodities
- The Port of Humboldt Bay handles forest products and fuels
- The Port of San Francisco handles bulk commodities and autos
- The Ports of West Sacramento and Stockton handle bulk commodities and break-bulk cargo

California also has numerous private terminals that handle liquid and dry bulk commodities, such as petroleum products, gypsum, and scrap metal.

Container Port Competition
As container ports, Los Angeles, Long Beach, and Oakland compete for different trade flows in different ways.

The San Pedro Bay ports handle essentially all dry containerized cargo moving to and from Southern California, with incidental amounts moving via Oakland or Mexican ports. To some extent, the Ports of Los Angeles and Long Beach compete with the Ports of San Diego and Hueneme for refrigerated cargo. Port Hueneme and San Diego, however, are served by specific carriers in the refrigerated fruit trade that does not call at San Pedro Bay, so the primary competition is between carriers, while the ports may compete for carrier calls.

The Port of Oakland handles nearly all containerized imports and exports for Northern California, as well as some intermodal cargo moving to and from inland points.

California container ports compete with other U.S. and North American ports in two ways:

1. California ports compete for “discretionary” container traffic that can move by rail to other regions through any one of several ports. For example, Los Angeles or Long Beach compete for Asian imports to Midwestern consumer markets with the Ports of Oakland, Vancouver, Prince Rupert, New York-New Jersey, Baltimore, and Norfolk.
2. California ports compete with other regions for the location of import DCs and their inbound trade flows. For example, Riverside County might compete with Georgia for a new import DC that would bring in goods through either Los Angeles/Long Beach or Savannah.

In the case of discretionary cargo, economic activity and employment, both at the port and in the transportation network, are at risk due to competition with other ports. In the case of import DC location, economic activity and employment at the DC itself are also at risk due to competition with other regions.

The large local and regional markets in Southern California draw first inbound vessel calls to Los Angeles and Long Beach. Inland importers use these vessel schedules to get the fastest service from Asia. However, Pacific Northwest and British Columbia ports have faster sailing times from ports in North Asia (e.g. Korea, japan, Northern China), giving these ports a transit time advantage over California ports for discretionary intermodal imports

For exports, Oakland's geographic position near California agricultural production gives it an advantage. Oakland is also often the last port of call before vessels return to Asia, providing a faster shipping option for exporters. As a result, Oakland is one of few U.S. ports where containerized exports exceed imports.

There is an overlap between the Los Angeles, Long Beach, and Oakland markets in the Central and Southern San Joaquin Valley. There, importers and exporters may choose ports based on relative trucking ocean costs and timing of vessel schedules.

Port Market Shares

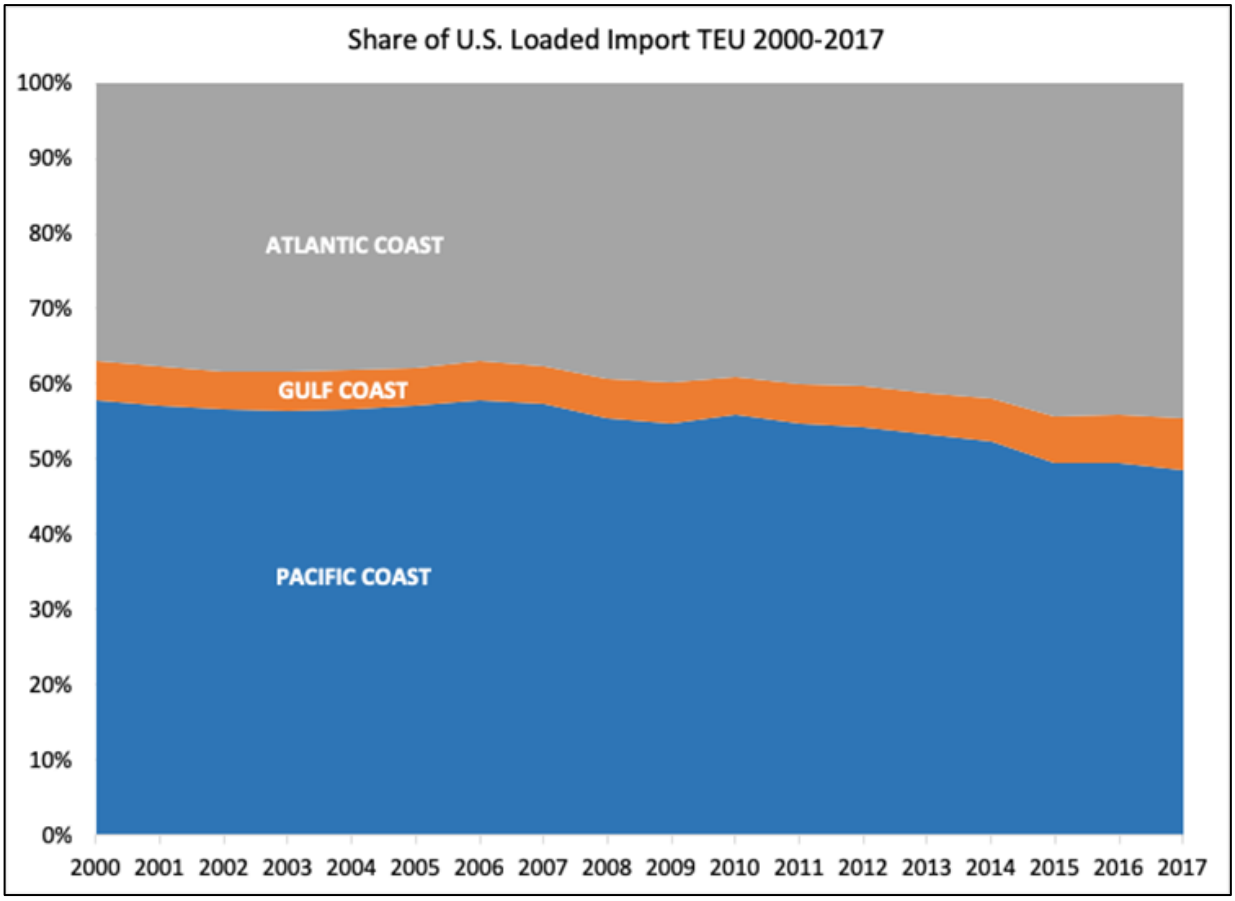
Table C.1. and **Figure C.1.** show the Pacific Coast ports combined had a 55 to 58 percent share of the loaded U.S. import container trade from 2000 through 2012. Starting in 2012, that share declined to 49 percent in 2017[4,5]. Since 2012, the Atlantic port share has risen from 40 to 45 percent and the Gulf port share from 5 to 7 percent. This apparent loss of market share, shown graphically in

Figure C.1 has prompted concerns over the competitiveness of California's container ports.

Table C.1. Coastal Shares of Loaded Import TEU, 2000-2017

Year	Pacific	Atlantic	Gulf
2000	58%	37%	5%
2001	57%	38%	5%
2002	57 %	38%	5%
2003	56 %	38%	5%
2004	57 %	38%	5%
2005	57%	38%	5%
2006	58%	37%	5%
2007	57%	38%	5%
2008	55%	39%	5%
2009	55%	40%	5%
2010	56%	39%	5%
2011	55%	40%	5%
2012	54%	40%	5%
2013	53%	41%	6%
2014	52%	42%	6%
2015	50%	44%	6%
2016	50%	44%	6%
2017	49%	45%	7%
Source: American Association of Port Authorities			

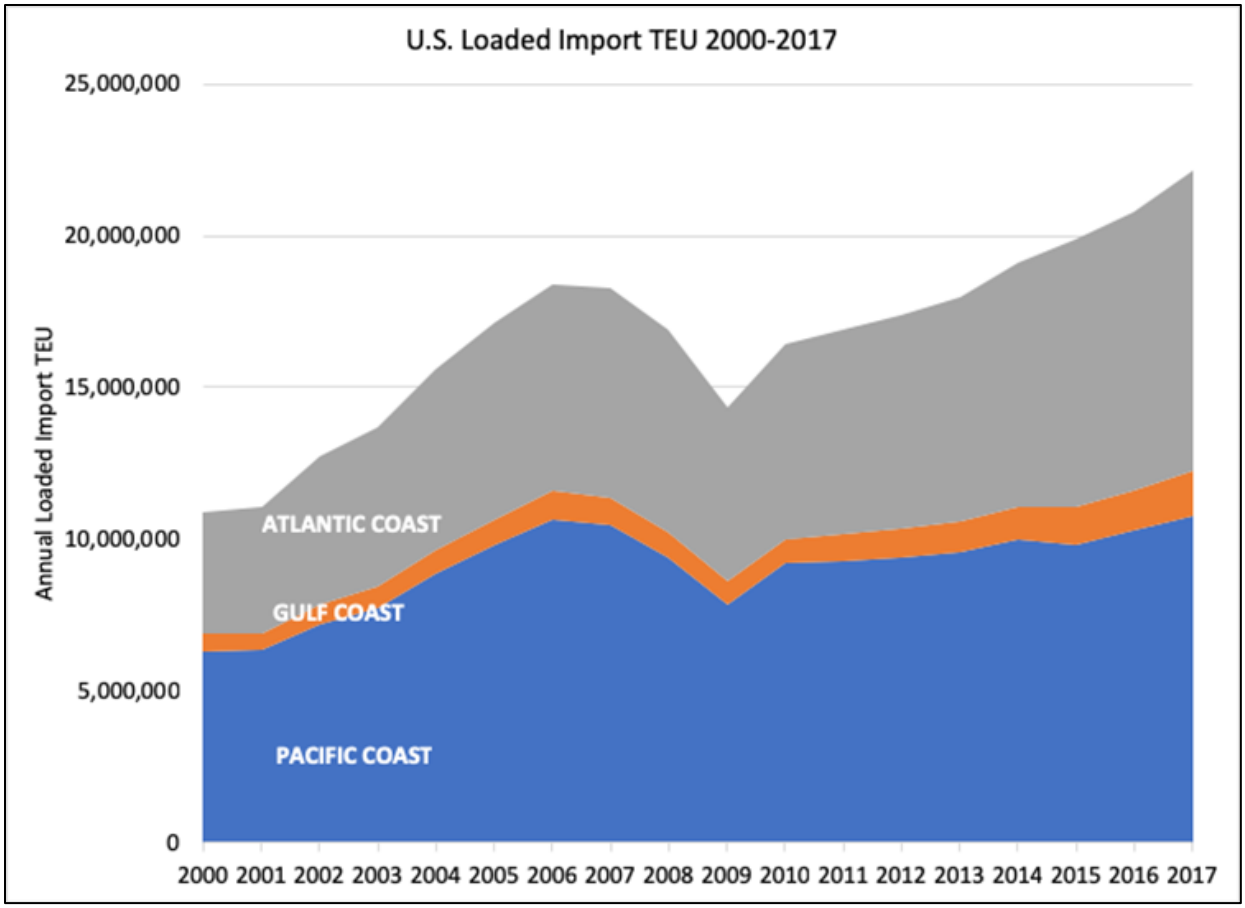
Figure C.1. A Shift in Coastal Import Shares



Source: American Association of Port Authorities

As **Figure C.1**. reveals, however, the market share shift did not result from net cargo loss at California or Pacific Coast ports, but from faster growth at Atlantic and Gulf Coast ports. Imports on all three coasts grew rapidly up to a peak in 2006-2007, then fell off during the 2008-2009 recession. After the recession, growth resumed on all coasts (although interrupted on the West Coast by the labor-management dispute of late 2014 and early 2015). **Figure C.2.** shows the U.S Loaded Import TEU by Coast, 2000-2017. [6]

Figure C.2. U.S. Loaded Import TEU by Coast, 2000-2017



Source: American Association of Port Authorities

There was faster growth on the Atlantic and Gulf coasts for several reasons identified in the literature and trade press:

- Strong growth in the transatlantic/European and Caribbean/South American trades served by the Atlantic and Gulf ports
- Increased use of Suez Canal routings from Southeast Asia to the U.S., driven in part by a shift of manufacturing and sourcing from China to Southeast Asia and the Indian subcontinent
- Increased adoption of "three corners" and "four corners" logistics strategies by large importers (notably large retail chains), which dispersed import flows from the major Southern California gateway [7, 8]
- A reduction in Southern California import transloading
- An increase on rail intermodal service, leading ocean carriers to replace rail movements from Southern California to some inland markets with truck or rail moves from other ports

- Rising costs of locating and operating distribution and manufacturing facilities in California, versus aggressive economic development efforts in other states
- Modernization and increased capacity at Atlantic and Gulf ports
- New Panama Canal locks permitting larger, more efficient vessels on that route
- Increased cost at Southern California ports (and California ports in general) due to "clean truck" requirements, PierPass/Off Peak fees, and rising drayage costs from port and highway congestion
- Concern over West Coast labor relations stability after the lengthy 2014-2015 dispute and accompanying shipping disruption

Of these factors, only the last two are specific to California ports; the others are shifts in trade patterns and in the economic context in which California ports must compete.

There is virtually no publicly available information on relative costs at different container ports. The fees that marine terminal operators charge their ocean carrier customers are negotiated and embodied in confidential contracts. The rents that port authorities charge marine terminals operators are likewise negotiated and confidential.

Table C.2. provides a key perspective on the relative growth of California's container port volumes.[9] In the rapid growth era of 1990-2007, Southern California ports outperformed the nation. Much of the cargo and share growth in that period was attributable to the rapid expansion of rail intermodal container movements through San Pedro Bay in response to the introduction and adoption of double-stack rail cars. This period also saw an increase in the practice of import transloading: bringing in international containers of imported merchandise and transferring the goods to domestic containers or trailers in Southern California. Finally, this period also saw dramatic growth in U.S. imports from China, with Southern California as the leading gateway. The Port of Oakland did not benefit as much from the expansion of intermodal traffic or transloading, and Northern California TEU totals did not grow as fast.

Table C.2. Container Port Cargo Growth Rates 1990-2017

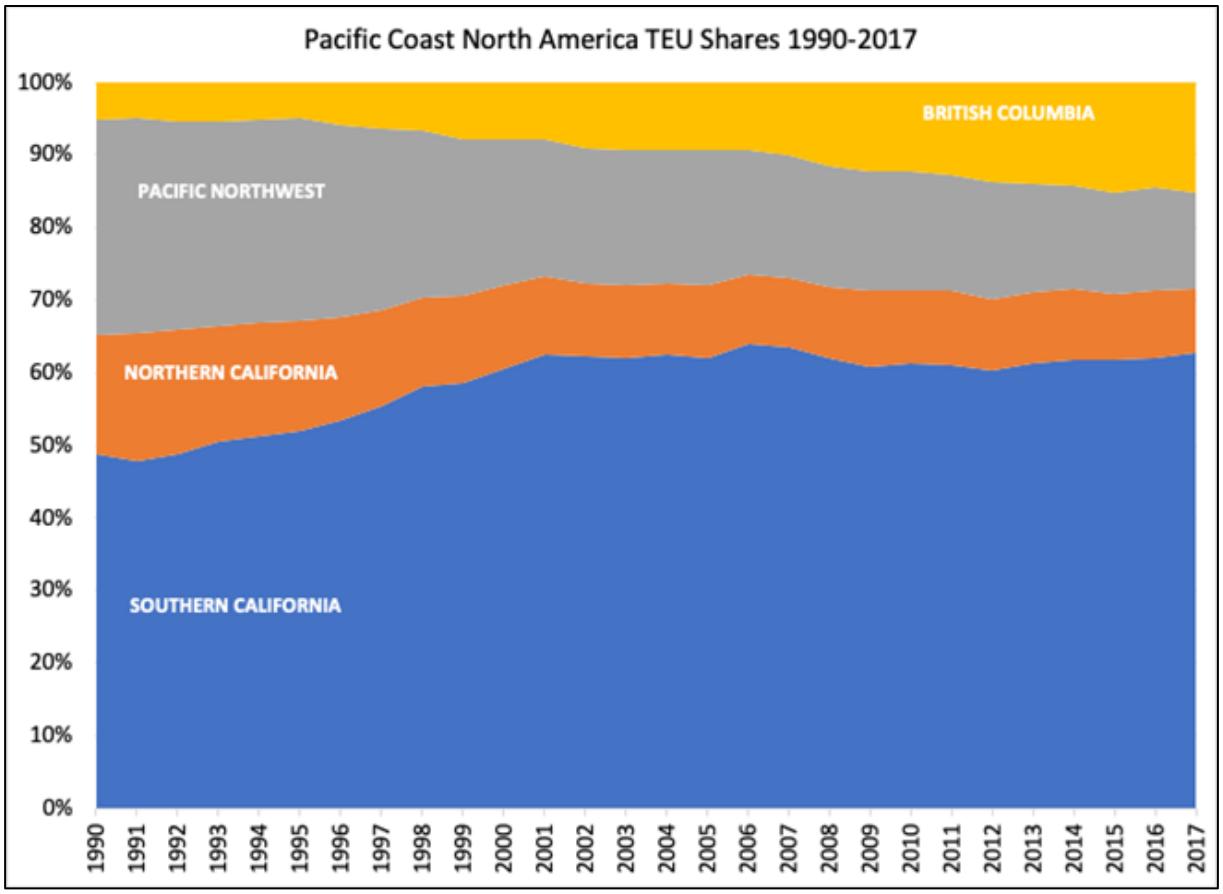
Compound Average Growth Rate (CAGR)	1990-2007	2007-2009	2009-2017
U.S.	6.4%	-6.1%	4.4%
California	7.9%	-8.4%	4.3%
Southern California	8.9%	-8.9%	4.6%
Northern California	3.8%	-5.0%	2.1%
Pacific Northwest	3.6%	-8.1%	1.4%
British Columbia	11.7%	-1.3%	7.1%
Source: American Association of Port Authorities			

U.S. container ports were hit hard by the recession, with Southern California losing 24 percent of its 2007 peak volume by 2009. Following the recession, the Southern California ports rebounded slightly faster than the nation. Oakland's volume dropped by 14 percent during the recession but did not grow as quickly after partial recovery in 2010. The labor-management issues in late 2014 and early 2015 hampered recovery for all U.S. West Coast ports.

Table C.2. also highlights one other critical factor: the rapid growth of the British Columbia ports as a gateway to both Canadian and U.S. markets. Before the recession, the Port of Vancouver began working with the Canadian railroads to offer highly competitive rail intermodal service to both markets. This effort, backed by Transport Canada's Asia-Pacific Gateway and Corridor Initiative, infrastructure funding, and the extension of Canadian railroads into U.S. markets through merger and acquisition, led to notable market share growth. The opening of Prince Rupert's Fairview terminal in 2007 created a second British Columbia rail intermodal gateway. Much of the market share gained by the British Columbia ports has come at the expense of U.S. Pacific Northwest ports (as suggested by their slow post-recession growth in **Table C.2**), but the success of Vancouver and Prince Rupert has restrained Southern California's growth as well.

Figure C.3. shows this shift of Pacific Coast shares graphically. The share going to California ports peaked in 2001 at 73.4 percent. [10,11] The post-recession California share has varied from 70.2 to 71.5 percent, where it stood in 2017. In contrast, the Pacific Northwest ports dropped from a high of 29.7 percent in 1990 to 13.2 percent in 2017. Portland has not handled significant container business since 2014. Seattle and Tacoma have joined forces as the Northwest Seaport Alliance, partly to rationalize infrastructure investment and reinforce marketing efforts.

Figure C.3. Pacific Coast North America TEU Shares 1990-2017



Source: American Association of Port Authorities

Ro-Ro Trade

For roll-on/roll-off (Ro-Ro) trade, mainly automobiles and vehicles, the Ports of San Diego, Long Beach, Hueneme, San Francisco, and Richmond all participate and compete. Ro-Ro facilities are the principal of two types: brand-linked (such as the Toyota import facility at Long Beach) and operator-based (such as the Pasha facilities at San Diego and San Francisco). Ports and terminal operators compete for multi-year contracts with major auto importers and on a shipment-by-shipment basis for other flows. The key factors in this competition are:

- Fit within the importer's international market strategy
- Access to major consumer markets
- Costs of ocean shipment, port handling, and vehicle processing
- Trucking costs to local and regional markets
- Rail access, service, and cost to intrastate markets

From the above factors, most often geography and market access are primary factors, and transportation cost is a secondary factor.

The Ports of Richmond and Benicia are entry and distribution points for imported autos, and Pasha has recently started up auto operations at the Port of San Francisco. Each manufacturer/importer tends to choose one or more ports as entry points for multi-year commitments. Ports and auto terminal operators, therefore, tend to compete for these long-term commitments rather than shipment-by-shipment. Other major West Coast auto import ports include Long Beach and Portland. To the extent that one importer may bring in autos to more than one port, the port terminal operators may compete for volume and territory, as do distributors of other goods.

Break-bulk Trade
"Break-bulk" trade, also called "general cargo", includes non-bulk, non-containerized commodities such as structural steel, lumber, and machinery. "Project cargo" is a key subcategory of break-bulk trade, and includes goods such as bridge components, refinery assemblies, subway car shells, and other goods requiring special handling to support a near-term local or regional project. Wind farm generator towers and blades are an important project cargo at many ports. Occasional project cargo shipments may be handled through special stowage on container vessels and handled at container terminals.

Project cargo and break-bulk cargo, in general, are typically handled at multi-purpose terminals at Los Angeles, Long Beach, Stockton, or West Sacramento. Handling and inland transport costs are high for items such as windmill blades, steel shapes, or transit cars, so shipments typically move through the closest port. California ports would thus compete with other California ports. The only significant area of overlap may be Northern California and Southern Oregon.

Oakland, Stockton, West Sacramento, and other Northern California ports do not compete with other ports for shipments to and from Northern California. Northern California importers and exporters do not regularly use the Southern California or Pacific Northwest ports unless they require a specific service that is not available in Northern California.

Bulk Commodities
There is also limited competition between regional ports for bulk commodity exports. The Port of Stockton and Levin Richmond Terminals have handled export coal and iron ore movements, primarily from Utah to China. These movements might have been handled through the bulk export terminal at the Port of Long Beach.

Southern California ports have major flows of petroleum products for local refineries and markets. The San Francisco Bay Area refineries act as petroleum import ports. They compete with other refineries for imports to the extent that they compete for inland markets (e.g. in the San Joaquin Valley) with refineries elsewhere (e.g. in Southern California).

Competition for California Air Cargo Business

Like seaports, the competitive position of California's cargo airports is largely determined by their geographic position relative to major markets.

Because both domestic and international air cargo tends to be time-sensitive, shippers commonly choose airports based on the combination of ground and air transit time. As a practical matter, the ground transit time to and from the airport may differ more than the air transit time, especially where carriers offer equivalent service from multiple airports. A shipper or air freight forwarder in the San Joaquin Valley might, therefore, choose between San Francisco (SFO) and Los Angeles (LAX) for an export shipment based on the truck time and cost to the airport, rather than on airport or air service characteristics.

Direct competition for air cargo business is largely regional, as outlined below:

- Oakland (OAK) and SFO compete for Bay Area air cargo, with OAK prevalent in domestic and SFO in international. San Jose (SJC) has a much smaller air cargo business at present
- Sacramento (SMF) and Mather (MHR) compete for air cargo business in the Sacramento area (DHL and UPS serve MHR)
- LAX and Ontario (ONT) compete for air cargo in Southern California with LAX having the dominant share. San Diego (SAN) competes for the southern portion of the market
- The numerous other California airports (Stockton, Modesto, Merced, Fresno, etc.) are served by feeder connections to the major airports. Stockton (SCK) has recently added service by Amazon flights

California airports compete with other states for hub status and for transfer/interchange freight.

Hub airports host a larger number of feeder flights to and from regional airports, as well as a full schedule of flights serving other major airports and markets. At present, California has the following hub relationships:

- LAX – DHL, FedEx, UPS
- ONT – UPS, FedEx
- SFO – FedEx (International)
- OAK – FedEx, UPS
- MHR – DHL, UPS

The competition for West Coast hub status is primarily within California, the nearest alternatives being Portland or Las Vegas. The size of the Northern and Southern California markets, however, will keep major air cargo hub locations within the state.

Major hubs may also compete for air cargo transfer/transshipment business between foreign and domestic carriers. For this market, all major West Coast international airports can be in contention: Anchorage, Seattle-Tacoma, San Francisco, Vancouver, and Los Angeles. The outcome of this competition is affected by on-airport costs and network connections, not by ground transportation issues.

Air cargo is increasingly dominated by the integrated carriers, chiefly FedEx, UPS, and DHL. To use these carriers the customer tenders the shipment locally, and the carrier chooses the

routing and the airports. UPS, for example, uses OAK but not SFO. California airports, therefore, compete mostly for the business of the integrated carriers rather than for the underlying customer choices. Passenger airlines continue to carry substantial volumes of "belly cargo". These air cargo services may be sold directly to the customer or through an air freight forwarder.

Relatively few producers or businesses rely heavily on on-air cargo due to the high cost. E-retailers such as Amazon make strenuous efforts to develop and manage regional and local distribution centers to minimize air cargo use. Businesses that do rely heavily on on-air cargo, particularly repair parts suppliers, are likely to locate next to a major national hub, or even on airport property. LAX, SFO, or OAK could compete for such businesses with other major hubs.

Key factors in airport competition include:

- Availability of takeoff/landing windows at key flight times
- Availability of gates and gate time slots for passenger services
- Airport landing and gate fees

Except for the air cargo transloading segment, which stays on the airport footprint, California's airports are not in close competition with those in other states. Goods movement mobility within the state is unlikely to affect the competitive position of California airports either nationally or internationally.

California Cost Differences

Freight Transportation Costs

Trucking Costs

Table C.3 shows average U.S. marginal trucking costs per mile for 2009–2017, as computed by the American Transportation Research institute.[12, 13] As of 2017, the average U.S. marginal cost per mile was estimated at $1.691.

Table C. 3. Average Marginal Costs per Mile, 2009-2017 (ATRI 2018)

Motor Carrier Costs	2009	2010	2011	2012	2013	2014	2015	2016	2017
Vehicle-based									
Fuel Costs	$0.405	$0.486	$0.59	$0.641	$0.645	$0.583	$0.403	$0.336	$0.368
Truck/Trailer Lease or Purchase Payments	$0.257	$0.184	$0.189	$0.174	$0.163	$0.215	$0.23	$0.255	$0.264
Repair & Maintenance	$0.123	$0.124	$0.152	$0.138	$0.148	$0.158	$0.156	$0.166	$0.167
Truck Insurance Premiums	$0.054	$0.059	$0.067	$0.063	$0.064	$0.071	$0.074	$0.075	$0.075
Permits and Licenses	$0.029	$0.040	$0.038	$0.022	$0.026	$0.019	$0.019	$0.022	$0.023
Tires	$0.029	$0.035	$0.042	$0.044	$0.041	$0.044	$0.043	$0.035	$0.038
Tolls	$0.024	$0.012	$0.017	$0.019	$0.019	$0.023	$0.020	$0.024	$0.027
Driver-based									
Driver wages	$0.403	$0.446	$0.460	$0.417	$0.440	$0.462	$0.499	$0.523	$0.557
Driver benefits	$0.128	$0.162	$0.151	$0.116	$0.129	$0.129	$0.131	$0.155	$0.172
Total	**$1.451**	**$1.548**	**$1.706**	**$1.633**	**$1.676**	**$1.703**	**$1.575**	**$1.592**	**$1.691**
Source: American Transportation Research Institute (ATRI) 2018									

As **Table C.4** shows, the costs vary by the trucking sector. Less-than-truckload (LTL) costs were higher at $1.84 per mile due to last mile pickup and delivery costs and terminal handling costs.[14] Truckload (TL) costs were lower at $1.49 per mile.

Table C.4. Average Total Marginal Costs by Sector, 2009-2017 (ATRI 2018)

Sector	2009	2010	2011	2012	2013	2014	2015	2016	2017
LTL	$1.43	$1.76	$1.93	$1.79	$1.84	$1.83	$1.60	$1.74	$1.84
Other	$1.67	$1.61	$1.79	$1.73	$1.67	$1.85	$1.72	$1.83	$1.95
TL	$1.36	$1.43	$1.57	$1.51	$1.60	$1.58	$1.50	$1.42	$1.49
Source: American Transportation Research Institute (ATRI) 2018									

The share data in **Table C.5** indicate that fuel accounts for 22 percent and driver wages and benefits are 43 percent of average marginal cost.[15]

Table C.5. Share of Total Average Marginal Cost, 2009-2017 (ATRI 2018)

Motor Carrier Costs	2009	2010	2011	2012	2013	2014	2015	2016	2017
Vehicle-based									
Fuel Costs	28%	31%	35%	39%	38%	34%	26%	21%	22%
Truck/Trailer Lease or Purchase Payments	18%	12%	11%	11%	10%	13%	15%	16%	16%
Repair & Maintenance	8%	8%	9%	8%	9%	9%	10%	10%	10%
Truck Insurance Premiums	4%	4%	4%	4%	4%	4%	5%	5%	4%
Permits and Licenses	2%	3%	2%	1%	2%	1%	1%	1%	1%
Tires	2%	2%	2%	3%	2%	3%	3%	2%	2%
Tolls	2%	1%	1%	1%	1%	1%	1%	2%	2%
Driver-based									
Driver wages	28%	29%	27%	26%	26%	27%	32%	33%	33%
Driver benefits	9%	10%	9%	7%	8%	8%	8%	10%	10%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Source: American Transportation Research Institute (ATRI) 2018									

Fuel economy ranges from 4.9 to 6.3 mpg, as shown in **Table C.6**.[16] At a mid-range value of about 6.8 mpg, California's recent $0.12 per gallon diesel fuel tax increase would add about $0.02 per mile to trucking costs.

Table C.6. Respondent Reported Fuel Economy Compared to Typical Operating Weight (ATRI 2018)

Typical Operating Weight	MPG
Less than 20,000 lbs	6.3
20,001-40,000 lbs	6.8
40,001-60,000 lbs	7.2
60,001-80,000 lbs	6.3
Greater than 80,000 lbs	4.9
Source: American Association of Port Authorities	

Table C.7 below shows that the West has an average marginal cost of about $1.616 per mile – higher than most regions, but lower than the Northwest.[17] If the Southeast and Southwest are

regarded as the West's key competitors, their average trucking costs are about 4 to 5 percent lower.

Table C.7. Average Marginal Cost per Mile by Region, 2017 (ATRI 2018)

Motor Carrier Costs	Midwest	Northeast	Southeast	Southwest	West
Vehicle-based					
Fuel Costs	$0.350	$0.336	$0.327	$0.314	$0.377
Truck/Trailer Lease or Purchase Payments	$0.238	$0.300	$0.242	$0.253	$0.230
Repair & Maintenance	$0.158	$0.163	$0.145	$0.128	$0.180
Truck Insurance Premiums	$0.077	$0.071	$0.061	$0.064	$0.078
Tires	$0.024	$0.025	$0.018	$0.021	$0.028
Tolls	$0.027	$0.040	$0.022	$0.023	$0.014
Driver-based					
Driver wages	$0.530	$0.575	$0.543	$0.564	$0.498
Driver benefits	$0.150	$0.194	$0.160	$0.129	$0.172
Total	**$1.591**	**$1.735**	**$1.553**	**$1.536**	**$1.616**
Source: American Association of Port Authorities					

It should be noted, however, that firms shipping to and from California locations do not necessarily pay the higher costs incurred by California-based motor carriers for the following reasons:

- National truckload carriers may be based anywhere in the U.S., and their cost structure may reflect a mix of labor, fuel, and other costs across many locations
- Large carriers recruit and pay drivers nationwide
- With fuel tanks holding up to 250 gallons, long-haul trucks can often avoid buying fuel at California prices

California's higher operating costs are therefore more likely to affect trucking within California, rather than affecting trucking to or from California. Out-of-state carriers do, however, compete for trips within California.

In the industry focus groups, Californian carriers expressed concern about competition from out-of-sate carriers with lower cost structures. These higher cost factors are 1) the higher fuel costs (noted above), 2) the higher costs of "clean" trucks to meet CARB requirements, and 3) congestion in California cities. However, out-of-state carriers must use CARB-compliant trucks when operating in California, and large cities in other states are also congested.

Within California, motor carriers are deeply concerned about highway and facility congestion that reduces driver productivity, vehicle productivity, and effective capacity. This issue has received the most attention in connection with port container drayage, where longer times

spent in terminals, and on congested highways to and from the terminals reduce the number and length of the trips a driver can make within HOS limits. These issues are not unique to California or to port drayage, as busy Pacific Northwest and East Coast ports have similar problems, and urban congestion affects all trucks. When in competition with less congested regions and ports such as Savannah or Charleston, however, these costs place California at a disadvantage. The higher cost of port drayage in California is likely to be a significant factor in choosing the location for import distribution facilities or export-oriented businesses, offsetting California's advantage in being closer to Asian sources and markets.

Potential State Actions

These observations imply that California public agencies can improve the state's competitiveness on trucking costs by:

- Increasing capacity on state highways and local roads to reduce congestion
- Deploying ITS technologies to reduce congestion and lower trucking costs
- Easing emissions limits, clean truck requirements, and fuel taxes (contrary to environmental objectives)
- Acting, where possible, to reduce truck driver time spent at marine terminals and other freight facilities
- Improving truck driver training to increase the supply of drivers

Railroad Costs

California is served by two Class 1 railroads: BNSF and Union Pacific. The two railroads have extensive networks across the Western states with connection to other railroads at Midwestern gateways, to Canada, and to Mexico. California's short line railroads operate within the state. Their rates and service would not ordinarily affect California's competitiveness with other states.

It is not ordinarily possible to compare railroad rates charged to California customers or for routes through California ports with rates elsewhere. Since economic deregulation in 1980, most railroad traffic has travelled under confidential, negotiated contract rates rather than under published tariffs. Those contracts may include annual volume commitments, rate tiers, fuel surcharges, or rebates that are not reflected in any public records.

Railroad operating costs may be slightly higher in California than in other states. There has been a series of CARB actions designed to reduce emissions from both line-haul and yard operations, including:

- Increased use of low-sulfur fuel
- Introduction of low-emission, high-efficiency road locomotives
- Introduction of hybrid and other low-emission switching locomotives

In many respects, the CARB actions simply accelerate requirements eventually implemented by the U.S. EPA. Recently, the railroads have been acquiring low-emission locomotives for use across their systems. Over time, any higher costs in California will thus tend to equalize.

Railroad rate making is driven by three objectives that sometimes conflict:

- Maximizing business volume
- Maximizing profits
- Maximizing infrastructure, equipment, and labor utilization

Where railroads face effective competition from other railroads, rates tend to be lower and railroads will accept lower profits. Where railroads have available capacity, they will set rates more competitively to fill that capacity. Where demand is higher, and capacity is tight, railroads will set rates higher to maximize profit.

Recent downturns in key rail traffic volumes may lead BNSF and UP to encourage intermodal and other traffic to and from California. With the advent of fracking, lower-cost natural gas has replaced coal as a fuel for many electric power plants. The resulting decline in railroad coal traffic has reduced profits and created excess capacity in many places. While BNSF and UP lines in California were not dramatically affected, system traffic levels and profitability on both railroads declined. Both railroads have been seeking to expand other traffic sources, which may benefit current and potential rail customers in California, as well as in other states.

Differences in railroad costs and service may affect the ability of California ports to compete for discretionary intermodal shipments with Pacific Northwest and British Columbia ports. As described earlier, in Canada's Pacific Gateway Initiative, Canadian railroads have cooperated with British Columbia ports and the Canadian government to improve rail access, capacity, and service in competition for discretionary cargo. It is generally believed in the shipping industry that the Canadian railroads have also engaged in aggressive rate setting in competition with U.S railroads – specifically BNSF and Union Pacific. These initiatives have contributed to the shift in market shares between U.S. and British Columbia ports on the West Coast of North America.

In at least one instance, the difficulty of developing facilities in California has prevented a railroad from improving service and lowering costs. BNSF's proposed Southern California Intermodal Gateway terminal (SCIG) would be located near the Ports of Los Angeles and Long Beach. Development of SCIG would add new, efficient intermodal transfer capacity to the port rail system and divert thousands of annual truck trips from I-710. SCIG development was initially proposed prior to 2011, but BNSF has so far been prevented from building the facility due to local opposition. Costs have risen to the point where BNSF may no longer find the project desirable. If SCIG is not built, then the competitiveness of the Ports of Los Angeles and Long Beach may decrease in the future.

Precision Scheduled Railroading

The advent of "Precision Scheduled Railroading" (PSR) may lead railroads to shed less profitable traffic while improving service to more profitable sectors. PSR generally consists of

improving rail service by pairing complex and less profitable services to simplify and speed up more profitable operations, permitting the railroad to improve overall service and profitability. Railroad industry investors and financial analysts tend to judge railroads by their operating ratio, the ratio of operating costs to revenue. UP, which historically enjoyed the industry's best operating ratio, produced a third quarter 2018 operating ratio of 61.7 percent, the same as in 2017. In comparison, railroads that had implemented PSR had operating ratios below 60 percent.

UP's Unified Plan 2020 (UP 2020), a new operating plan that implements PSR principles, was launched on October 1, 2018. The goal of UP 2020 is to help UP achieve a 60 percent operating ratio goal by 2020, on the way to eventually achieving a 55 percent operating ratio. UP 2020 is scheduled to be implemented in California in 2019. UP 2020 anticipates layoffs, some of which have already occurred, and more of which are planned. The strong economy and truck driver shortage is facilitating this strategy. Under this system, UP's financial hurdle for the continuation of any existing business or the addition of any new business will be much higher than in the past.

Ocean Shipping Costs

The ocean shipping rates paid by customers include the cost of vessel operations, the cost of terminal operations, fees assessed by ports, canal tolls, and ocean carrier overhead.

The current, highly competitive container shipping environment has resulted in very low rates for California shippers. Since the recession, containerized U.S. and world trade have grown slower than ocean carrier capacity. The capacity increase has been driven by carrier acquisition of larger container vessels to secure economies of scale. Faster growth in capacity than demand has resulted in persistent industry-wide overcapacity. Under these conditions, intense competition has driven down shipping rates to the point of widespread financial losses among the carriers.

The rate differences between California ports and their competitors are likely to be small and based on small differences in underlying cost. Container shipping at all U.S. and Canadian ports are dominated by the same carriers and carrier alliances. Many of the terminal operating costs are similar between California ports and competing ports elsewhere. All West Coast port terminals in North America are covered by the same basic labor contract, and many are operated by the same firms. The ports' own charges tend to be highly competitive. Vessels calling California ports do incur slightly higher costs for low-sulfur fuel and cold-ironing.

The opening of new, wider Panama Canal locks has enabled carriers to use large ships through the canal. The new locks can thereby reduce unit costs for Asia-East Coast voyages, competing with the combination of Asia-West Coast voyages and cross-country rail service. Some of the savings are captured in higher Panama Canal tolls, and moreover, the West Coast option is faster. The net result has been a minor shift in market share, as discussed in the section on port competition.

Almost all the relevant rates and fees are contained in confidential, negotiated contracts. It is not possible to assemble a quantitative comparison from available data.

Air Cargo Costs

The air cargo industry is dominated by the integrated carriers, Fedex and UPS, trailed by smaller air freight forwarders and airlines offering belly cargo space on passenger flights. Air cargo operations in California have similar costs as in other states, and California customers likely face similar rates for air cargo service.

Labor Costs

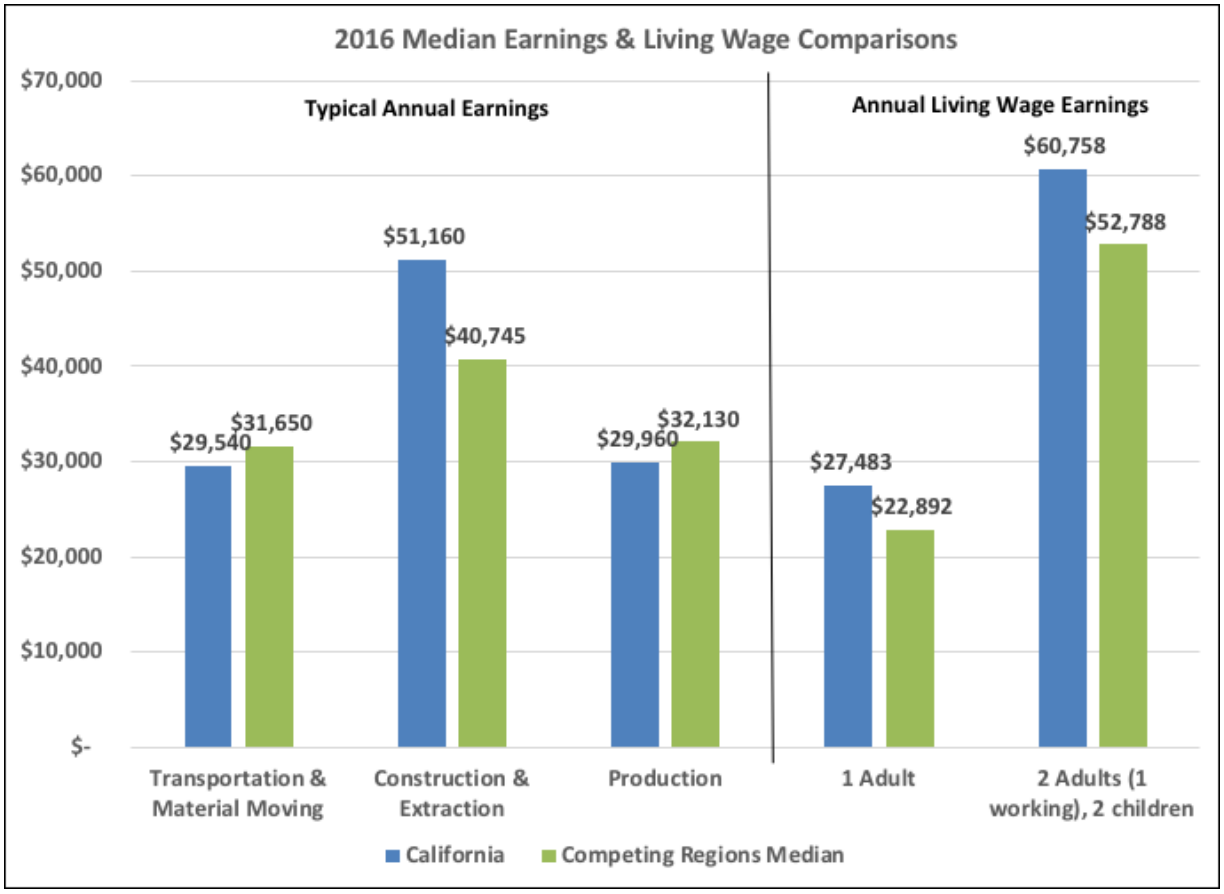
As

Figure **C.4**. shows, the differences in labor costs, reflected in median earnings and living wage levels, can vary. [18,19] California's median earnings for the transportation and material moving occupations and production occupations are comparable or even lower than in some competing regions. In the construction trades, California earnings are higher, likely due to higher housing demand and prices, and the strength of organized labor in public sector construction.

High housing and living costs in California create a higher threshold for "living wage" earnings than in some competing regions. The differences in these costs vary from about 7 to 20 percent.

Because transportation occupations do not pay more in California and living costs are higher, transportation workers may enjoy a better standard of living in other states. This disparity makes transportation and materials handling jobs in California relatively less attractive than they are in other states.

Figure C.4. 2016 Median Earnings Comparison



Source: Massachusetts Institute of Technology Living Wage Calculator

Land Costs

Land cost is a significant factor for businesses with multiple alternatives for production locations. Within states, business location is central and fundamental to the cost of commercial land. Lands in central business districts of dense urban areas cost many times more than the same commercial or industrial land area in undeveloped rural areas. Land costs become more significant as facility sizes, and ensuing land requirements, increase. Modern distribution centers typically occupy at least 100,000 square feet, and facilities over 1,000,000 square feet are common.

For investors who use commercial land and properties as investments, high land values can be attractive. California ranks first in a national study of total land valuation by an economist at the U.S. Bureau of Economic Analysis. [20] That study estimated the combined value of all land in the country, finding that California accounts for 17 percent of the total value of the land in the 48 contiguous states. States with generally larger rural areas tend to have lower commercial land values relative to their size, while states with more densely populated areas, especially along the coasts, tend to have the highest estimated value per acre. Land use policies and zoning affect commercial land valuation as well, with undeveloped land generally having lower value

per acre, while improved, commercially zoned properties with good transportation access have generally higher land values.

In a populous state such as California, possible alternative land uses affect current land values, especially where undeveloped commercial land in metropolitan areas is scarce. In those cases, land values for residential use influence commercial land values where the potential conversion of commercial space for housing use or mixed-use development competes with continued commercial use. Thus, an understanding of more readily available residential land valuation can provide context to understand commercial land valuation market pressures.

In California, residential land prices have been increasing for decades, even in comparison to the values of the buildings on the land. In a national study of property values by the Lincoln Institute, California residential land values as a percentage of total property values have increased substantially over the last 40 years. [21] Compared with 1976, the land value as a share of total property value increased from 36 percent to 61 percent. California ranks second nationally for this land value share, behind only Hawaii. This trend reflects the relatively high average cost of the land itself in California. Location matters, and the lower land values are found in many rural California areas with have led to the dispersion of businesses, especially distribution centers, into formerly rural areas near population centers. The Inland Empire in Southern California's San Bernardino and Riverside Counties is the best-known example, while the area of San Joaquin and Stanislaus Counties are known as the "Tracy Triangle" is a growing Northern California example.

Energy and Utility Costs

There are several energy source price metrics that affect California's competitiveness for business locations and freight movement, including the prices of petroleum gas, diesel, natural gas, and electricity.

Energy and utility costs, including electricity and water, can be prominent factors in facility operating costs and therefore in competition for such facilities between states. These factors become more important for facilities that use electric power for lighting, climate control, and production equipment, and water for processing. These costs also affect the cost of living for employees.

California's average commercial, industrial, and residential electric power rates are high compared with most other states. In 2018, according to the U.S. EIA, California had the fifth highest average commercial electricity rates, the sixth highest average industrial electricity rates, and the seventh highest average residential electricity rates. In studying a year of California's average commercial electricity rates, rates proved 59 percent higher in California than the US average for all other states. California's average industrial electricity rates for the same period were 100 percent higher than the average of all other states. California's average residential electricity rates were 49 percent higher than the average of all other states for this period.[22]

Average retail gasoline prices in California are higher than in other states; only Hawaii typically has higher gas prices than California. The difference is significant. For example, in September 2018 the price difference was $0.87 per gallon or 31 percent of the U.S. average gas price.[23] Gas price comparisons should be considered in the context of environmental regulations that require motor gasoline grades sold in California to create fewer emissions than in gasoline grades sold for less in other states.

Diesel fuel prices are an especially important factor in freight transportation, which currently still depends on diesel-powered trucks and rail locomotives. Compared with other states, California's average diesel fuel prices are commonly ranked second-highest, behind only Hawaii. In September 2018, for example, the average diesel fuel price in California was $0.86 higher than the average for the other states, a 27 percent difference.[24]

Another energy source price metric used as a competitiveness measure is natural gas. Average natural gas prices for transportation and for building heating and industrial process use are higher in California than in other states. The U.S. EIA reports that for the 12 months ending July 2018, California's average residential natural gas rates were 16 percent higher than the average for other states. In the same period, California's average natural gas rates for commercial customers were seven percent higher than the average for the rest of the U.S., while industrial natural gas customers in California paid an average natural gas rate 77 percent higher than the average for the rest of the country.

The energy price averages across the state mask local variations in a state as large as California. In California, regions are subject to various levels of regulation; therefore, there are specific prices for electricity and natural gas utilities, and the gasoline and diesel in each market across the state. As one example, in September 2018 the difference in average regular gasoline prices in California compared to the average for the rest of the U.S. varied from $0.77 in the Sacramento Region up to $0.97 in the Central Sierra Region.[25]

Comparative Distribution Center Costs

The combined impact of these various cost factors is evident in overall operating costs for distribution centers or other industrial facilities. The comparisons in this section were derived from *Comparative Distribution Warehousing Costs in Port and Intermodal-Proximate Cities*, a 2015 report by The Boyd Company, Inc. The Boyd study estimated costs for 25 potential distribution center locations, including Patterson and Tracy in Northern California and Hesperia, Apple Valley, Victorville, and Mira Loma in Southern California. Warehouse operating costs were scaled to a hypothetical 500,000 sq. ft. facility employing 150 nonexempt workers and shipping over-the-road to the nearest intermodal and port city.

As **Table C.8** indicates, California locations had the highest annual combined costs except for points in the Northeast and Idaho. [26] The estimate for Tracy, for example, was 16% higher than in Cordele, GA, and the company would save $1.85 million annually by choosing Cordele over Tracy.

Table C.8. Distribution Center Operating Cost Ranking, 2015

Total Annual Geographically-Variable Operating Cost Ranking	
Distribution Warehouse Location	**Total Annual Operating Costs**
Stoughton, MA	$15,081,230
Meadowlands, NJ	$14,631,975
Idaho Falls, ID	$14,576,733
Bordentown, NJ	$14,273,497
Newburgh, NY	$13,660,758
Tracy, CA	$13,302,372
Patterson, CA	$13,104,947
Hesperia, CA	$12,937,809
Apple Valley, CA	$12,923,646
Victorville, CA	$12,913,886
Mira Loma, CA	$12,912,925
Bethlehem, PA	$12,894,630
Casa Grande, AZ	$12,694,040
Miramar, FL	$12,573,879
Kent, WA	$12,490,728
Mequite, NV	$12,490,074
York, PA	$12,120,409
Kingman, AZ	$11,936,644
Springfield, OR	$11,935,905
Fernley, NV	$11,899,135
Columbia, SC	$11,728,259
Humble, TX	$11,661,803
Cordele, GA	$11,450,594
Ritzville, WA	$11,351,481
Chesterfield, VA	$11,289,491
Source: Comparative Distribution Warehousing Costs in Port and Intermodal-Proximate Cities	

Table C.9 breaks down the operating cost estimates for locations in Southern California and competing locations in Arizona. Labor, electric power, and amortization (construction) costs are markedly higher in California, while property and sales tax costs are higher in Arizona.[27] The much higher transportation cost to reach Arizona is a tradeoff for the otherwise lower operating costs. Even with the offsetting transportation costs, Kingman is about a million dollars less annually than the Southern California locations.

Table C.9. Annual DC Operating Costs, California vs. Arizona

Comparative Annual Operating Cost Simulation Summary	Casa Grande	Kingman	Apple Valley	Hesperia	Mira Loma
	AZ	AZ	CA	CA	CA
	Metro Area	Metro Area	Metro Area	Metro Area	Metro Area
Nonexempt Labor					
Weighted Average Hourly Earnings	$13.90	$12.55	$16.42	$16.70	$16.85
Annual Base Payroll Costs	$3,969,840	$3,584,280	$4,689,552	$3,769,520	$4,812,360
Fringe Benefits	$1,349,746	$1,218,655	$1,594,448	$1,621,637	$1,636,202
Total Annual Labor Costs	$5,319,586	$4,802,935	$6,284,000	$6,391,157	$6,448,562
Electric Power Costs	$581,892	$655,200	$837,888	$837,888	$837,888
Amortization Costs	$3,143,710	$3,121,886	$3,984,366	$3,994,324	$4,072,557
Property and Sales Tax Costs	$1,662,052	$1,596,576	$1,234,805	$1,237,025	$1,260,146
Shipping Costs	$1,986,800	$1,760,047	$582,587	$477,415	$293,772
Total Annual Geographically-Variable Operating Costs	**$12,694,040**	**$11,936,644**	**$12,923,646**	**$12,937,809**	**$12,912,925**

Source: Comparative Distribution Warehousing Costs in Port and Intermodal-Proximate Cities

Table C.10 shows the construction cost and land cost differences that drive the amortization costs higher in California.[28] With higher land and construction costs, the same warehouse in California would cost roughly $15 million or approximately 27 percent more in California than in Arizona.

Table C.10. Warehouse Construction and Amortization Costs, California vs. Arizona

Warehouse Construction and Amortization Costs	Casa Grande	Kingman	Apple Valley	Hesperia	Mira Loma
	AZ	AZ	CA	CA	CA
	Metro Area	Metro Area	Metro Area	Metro Area	Metro Area
Site Acquisition: No. of Acres	35	35	35	35	35
Cost per Acre	73,500	$57,500	$298,500	$303,500	$322,500
Site Improvement Cost	-	-	-	-	-
Total Land Cost	$2,572,500	$2,012,500	$10,447,500	$10,622,500	$11,287,500
Construction Cost	$32,677,230	$32,853,690	$39,576,510	$39,576,510	$40,286,430
Machinery and Equipment	$20,000,000	$20,000,000	$20,000,000	$20,000,000	$20,000,000
Total Project Investment	$55,249,730	$54,866,190	$70,024,010	$70,199,010	$71,573,930
Project Amortization					
Cost of Funds (Interest)	3.0%	3.0%	3.0%	3.0%	3.0%
Payment Factor	0.0569	0.0569	0.0569	0.0569	0.0569
Total Annual Amortization Cost	**$3,143,710**	**$3,121,886**	**$3,984,366**	**$3,994,324**	**$4,072,557**

Source: Comparative Distribution Warehousing Costs in Port and Intermodal-Proximate Cities

Table C.11 breaks down the operating cost estimates for locations in Southern California and competing locations in the Southeast.[29] Labor, electric power and amortization (construction) costs are again markedly higher in California. Property and sales tax costs can be either lower or higher in the Southeast. The transportation cost differences are minimized by the proximity to the South Atlantic ports. Overall, the Southeast locations can be about $0.5 million to $1.8 million lower annually than the California locations.

Table C.11. Annual DC Operating Costs, California vs. Southeast

Comparative Annual Operating Cost Simulation Summary	Patterson CA Metro Area	Tracy CA Metro Area	Victorville CA Metro Area	Miramar FL Metro Area	Cordele GA Metro Area
Nonexempt Labor					
Weighted Average Hourly Earnings	$16.99	$17.00	$16.52	$15.05	$14.13
Annual Base Payroll Costs	$4,852,344	$4,855,200	$4,718,112	$4,298,280	$4,035,528
Fringe Benefits	$1,649,797	$1,650,768	$1,604,158	$1,461,415	$1,372,080
Total Annual Labor Costs	$6,502,141	$6,505,968	$6,322,270	$5,759,695	$5,407,608
Electric Power Costs	$702,000	$958,368	$837,888	$520,788	$477,360
Amortization Costs	$4,212,951	$4,245,771	$3,992,332	$3,721,880	$3,075,686
Property and Sales Tax Costs	$1,208,857	$1,292,371	$1,236,581	$1,584,364	$1,123,754
Shipping Costs	$478,998	$299,894	$524,815	$987,152	$1,366,186
Total Annual Geographically-Variable Operating Costs	**$13,104,947**	**$13,302,372**	**$12,913,886**	**$12,573,879**	**$11,450,594**

Source: Comparative Distribution Warehousing Costs in Port and Intermodal-Proximate Cities

Table C.12 shows the construction cost and land cost differences that drive the amortization costs higher in California.[30] With higher land and construction costs, the same warehouse in California would cost roughly $5 to 20 million more in California than in Georgia or Florida.

Table C.12. Warehouse Construction and Amortization Costs, California vs. Southeast

Warehouse Construction and Amortization Costs	Patterson	Tracy	Victorville	Miramar	Cordele
	CA	CA	CA	FL	GA
	Metro Area	Metro Area	Metro Area	Metro Area	Metro Area
Site Acquisition: No. of Acres	35	35	35	35	35
Cost per Acre	348,000	$358,500	$302,500	$315,500	$76,500
Site Improvement Cost	-	-	-	-	-
Total Land Cost	$12,180,000	$12,547,500	$10,587,500	$11,042,500	$2,677,500
Construction Cost	$41,861,310	$42,070,617	$39,576,510	$34,368,390	$31,376,730
Machinery and Equipment	$20,000,000	$20,000,000	$20,000,000	$20,000,000	$20,000,000
Total Project Investment	$74,041,310	$74,618,117	$70,164,010	$64,410,890	$54,054,230
Project Amortization					
Cost of Funds (Interest)	3.0%	3.0%	3.0%	3.0%	3.0%
Payment Factor	0.0569	0.0569	0.0569	0.0569	0.0569
Total Annual Amortization Cost	**$4,212,951**	**$4,245,771**	**$3,992,332**	**$3,721,880**	**$3,075,686**

Source: Comparative Distribution Warehousing Costs in Port and Intermodal-Proximate Cities

These comparisons resonate with comments made by industry stakeholders in the CFMP workshops. The cost advantages of the Southeast states also align with the market shares gains made by Southeast ports at the expense of California ports.

Perceptions of California's Business Climate

Many of the freight industry stakeholders contacted for this study perceive an "anti-business" attitude in California, and see that attitude manifest in environmental regulations, high taxes and fees, and opposition to facility development.

Opinions and concerns over California's friendliness to business are evident in state rankings on the ease of doing business, or as places to start a business. For example, WalletHub used a variety of statistics to rank states as places to start a business (**Table C.13**).[31] Although California ranked eighth overall, it lagged behind states such as Texas and Georgia that are

making strong efforts to attract firms. It is notable that California ranked forty-seventh in business costs. In addition, below are three other related publications regarding California's business climate.

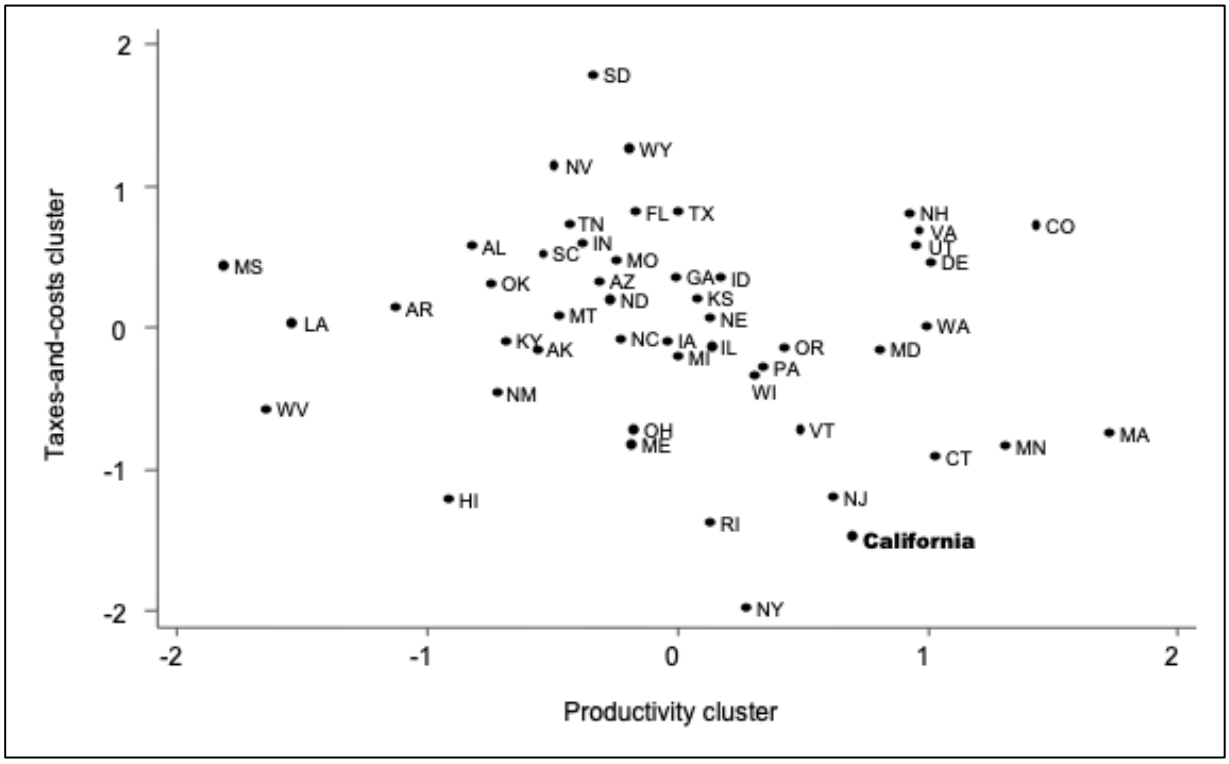
- A ranking by USA Today placed California 15th among the best states in which to do business.[32]
- Similarly, a 2018 CNBC poll placed California 25th among "America's Top States for Business".[33] California was ranked:
  - 12th on workforce
  - 24th on infrastructure
  - 48th on the cost of doing business
  - 11th on the economy
  - 21st on quality of life
  - 1st on technology
- A 2009 study by the Public Policy Institute of California compared multiple rankings and found that California typically ranks highly on productivity, but poorly in terms of taxes and costs (**Figure C.5**). [34, 35]

Table C.13. WalletHub Ranking of Best States to Start a Business

Overall Rank (1=best)	State	Total Score	"Business Environment" Rank	"Access to Resources" Rank	"Business Costs" Rank
1	Texas	61.05	1	11	30
2	Utah	60.95	7	2	26
3	Georgia	58.12	5	17	13
4	North Dakota	57.68	2	19	32
5	Oklahoma	57.58	8	36	1
6	Florida	56.75	4	20	21
7	Arizona	54.39	9	12	29
8	**California**	**54.30**	**3**	**3**	**46**
9	Montana	53.71	11	30	8
10	Colorado	52.67	6	18	34
Source: WalletHub, 2019					

California is viewed by some sources as a magnet for high-tech research and product development, with superlative access to venture capital and expertise. These advantages, however, do not translate well for a wholesaler seeking to build a distribution center.

Figure C.5. California's Business Climate Rankings



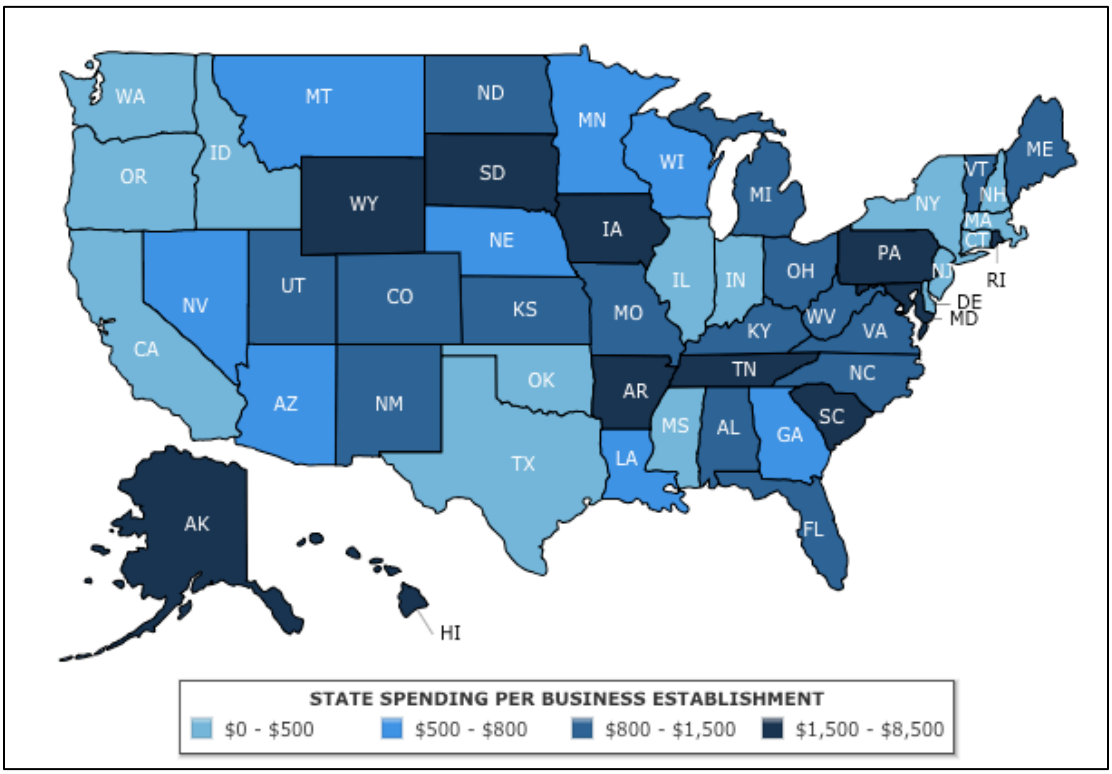
Source: Public Policy Institute of California, 2009

Competitive Economic Development Efforts

Industry outreach efforts have revealed deep concerns over California's economic development efforts and the linkage of those efforts to goods movement, logistics, and freight transportation infrastructure.

Figure C.6 shows relative state spending on economic development and related functions, such as work force development, in Fiscal Year 2016, as compiled by the Council for Community and Economic Research. California ranked 48th among the 50 states.[36] As calculated by the Council for Community and Economic Research, the State spent only $173 per business establishment on economic development programs in Fiscal Year 2016. The only states that spent less were Massachusetts and Connecticut. **Table C.14** compares California's spending in Fiscal Year 2016 with major competing states.[37] The spending by the Southeast states is noteworthy and paralleled with strong economic development in that region.

Figure C.6. State Economic Development Spending, Fiscal 2016



Source: The Council for Community and Economic Research, 2016

Table C.14. State Economic Development Spending

State	Fiscal 2016 Spending per Business
California	$ 173
Texas	$ 237
Arizona	$ 532
Nevada	$ 696
Georgia	$ 758
North Carolina	$ 988
Alabama	$ 988
Utah	$ 1,097
Florida	$ 1,113
South Carolina	$ 1,753
Source: Council for Community and Economic Research, 2016	

Conventional vs. Logistics-Based Economic Development

While conventional economic development practices and tools are widely known and used, logistics-based economic development efforts use slightly different tools and have different targets. Rather than seeking new corporate headquarters or manufacturing developments based on local cost advantages, logistics-based development expands the market to include transportation, distribution, and logistics facilities on the basis of supply chain efficiency. **Table C.16** highlights the differences between the two types of development. [38]

Table C.16. Economic development and logistics-based development comparison

Economic Development	Logistics-Based Development
Goal: Attract beneficial businesses and organizations to the region.	Goal: Attract logistics-based businesses to the region.
Message: The region is an attractive, low-cost, and high-yield place to do business.	Message: The region/site offers specific logistical advantages (besides its general business advantages).
Anchor Tenants: Any business, but often manufacturers.	Anchor Tenants: Distribution centers, carrier facilities.
Issues and tools:	Issues and tools:
Location assistance	Freight transportation infrastructure (truck, rail, water, air)
Zoning and permitting	
Telecom & utilities	Location on trade lanes and corridors
Labor pool	Role in supply chains
Marketing assistance	Freight carrier participation
Financial assistance	Regional & national market access
Cost of doing business	Cost of logistics
Local business climate	Local receptivity to freight & logistics
Source: Tioga Group	

Conventional Economic Development

Economic development agencies typically have responsibility for attracting a wide range of desirable businesses and other organizations to the region. The target organizations and businesses can range from a franchise restaurant to a department store or an auto manufacturer. The basic message of economic development agencies is, “Our region is an attractive place for your organization.” For businesses, the message tends to emphasize low capital and operating costs, a high-yield market, and various financial incentives. For headquarters offices, the agency is more likely to emphasize the quality of life and cultural advantages. In seeking an “anchor tenant” for a large development, an economic development agency is likely to seek a manufacturer, hotel, department store, or office building as appropriate. Economic development agencies will address transportation issues but tend to emphasize passenger transportation and access to regional markets.

Logistics-based Economic Development

By focusing on the freight transportation and logistics advantages of a candidate site, logistics-based developers bring additional tools and leverage to bear on location decisions. The Alliance Texas development, for example, is one of the earliest and best-known logistics-based developments. A critical distinction is that logistics-based advantages can complement and strengthen the basic attractions of a city, region or site, but cannot override the poor location. Logistics-based development is much more likely to succeed with the involvement of a specialized master developer, such as CenterPoint Properties (Joliet) or the Hillwood Group (Alliance Texas, Alliance California). Another key factor in successful logistics development is willing long-term commitments from trucking companies, ports, railroads, air cargo operators, or other carriers. The difference between logistics-based development and market-based development is illustrated by the emergence of trade and transportation corridors as DC candidates. DCs used to be located to serve a given local or regional market at the least cost, usually by locating them at or near the center of the market. A category of DCs is emerging, however, and is intended for forwarding distribution of transloaded or sorted goods to more distant points in a corridor. The two Wal-Mart DCs at Joliet, for example, are intended primarily to receive import loads from the Pacific Northwest and distribute sorted goods to points in Chicago and eastward.

Canada's Asia-Pacific Gateway Initiative

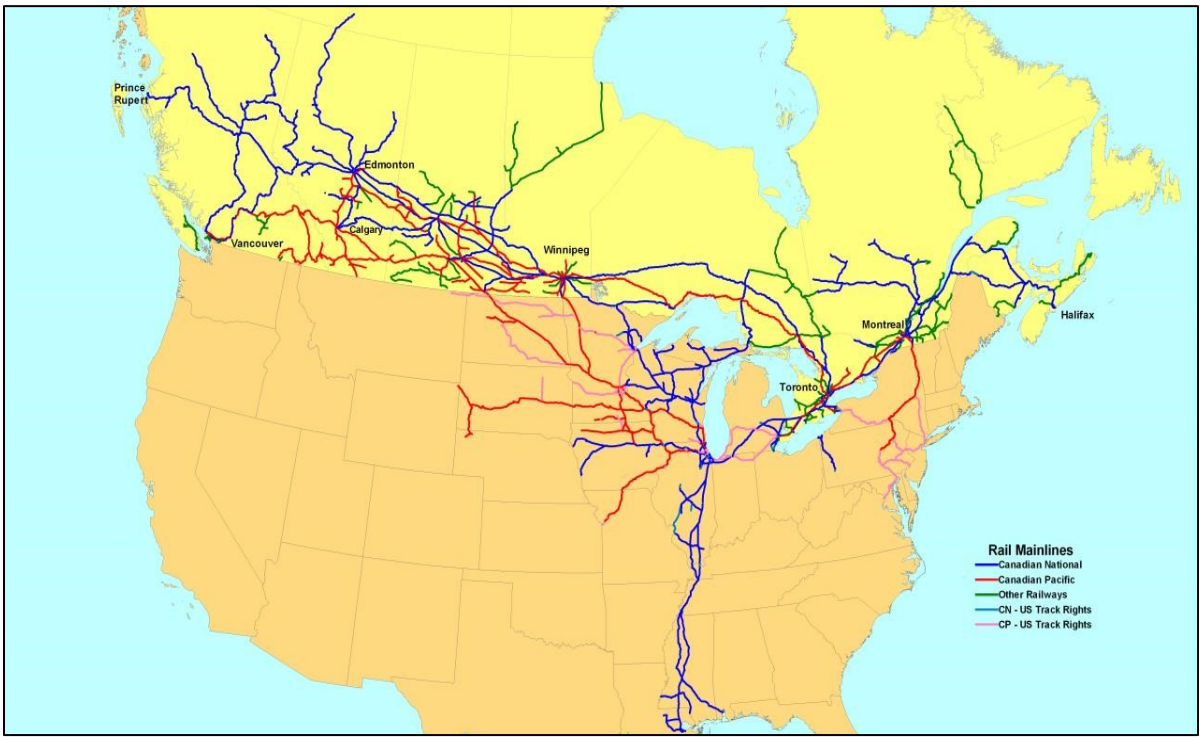
Canada launched the Asia-Pacific Gateway initiative in 2006, and the program is on-going:

> The primary objective of the Asia-Pacific Gateway and Corridor Transportation Infrastructure Fund is to address capacity challenges facing Canada's Asia-Pacific Gateway and Corridor transportation system. The Asia-Pacific Gateway and Corridor Transportation Infrastructure Fund provides funding for strategic infrastructure projects in British Columbia, Alberta, Saskatchewan, and Manitoba that enhance the competitiveness, efficiency, and capacity of Canada's multimodal transportation network focused on international commerce with the Asia-Pacific region.
>
> The Asia-Pacific Gateway and Corridor Transportation Infrastructure Fund transfer payment program will result in the completion and advancement of strategic transportation infrastructure projects that contribute to the objectives of the Asia-Pacific Gateway and Corridor Initiative, including addressing bottlenecks, capacity constraints and other impediments to the flow of trade.[39]

Expenditures were $18.5 million in the Fiscal Year 2016–2017 and are planned for $32.6 million in the Fiscal Year 2017–2018.

In November 2018, Canada announced that it would invest $16.7 million in transportation infrastructure to improve the competitiveness of the Port of Prince Rupert. Fairview Terminal at Prince Rupert handles only discretionary rail intermodal cargo. As **Figure C.7** shows, Prince Rupert is connected to U.S. Midwestern and Eastern markets by rail.[40]

Figure C.7. Prince Rupert Rail Connections



Source: Port of Prince Rupert

Prince Rupert has already attracted substantial cargo away from Southern California ports, and intends to attract more:

> "Chicago remains the top destination for import containers from Asia," said Brian Friesen, Prince Rupert's director of trade development. "Toronto and Montreal are up there as is Memphis, a destination that has seen a lot of growth in the past few years. We are also seeing growth in Detroit and the Ohio valley. Much of that is driven by auto parts. On the way out, we are seeing agricultural products from the Midwest coming to Prince Rupert via the CN network which are then shipped to overseas markets."[41]

A key strength of the Asia-Pacific Gateway Initiative is its flexibility:

> The targeted recipients are provinces and territories, including provincial and territorially-owned transportation entities; municipalities, including municipally-owned transportation entities; public sector organizations, including transit agencies, commissions and boards but excluding federal Crown corporations; not-for-profit organizations; and, industry-related organizations, including for-profit organizations and Canada Port Authorities (subject to Canada Marine Act amendments).[42] Funds have been used to support workforce programs as well as improving infrastructure.

From the freight industry's perspective, the construction of some major California network improvements requires a long lead time that needs to be accounted for. The I-710 Corridor

project, for example, has been in progress for over 15 years with no tangible capacity improvements.

Implications for Competitiveness and Potential Improvements

Competitiveness is a matter of degree rather than a dichotomy. California's competitiveness varies depending on the type of decision being made, the industry sector and products involved, and the location within California. California is highly competitive in sectors where its resources, products, markets, and capabilities are difficult to match elsewhere. Examples include unique agricultural products and high-technology research and development. Freight mobility is a minor factor in those sectors. California is much less competitive for businesses or functions that can be readily located elsewhere and that are vulnerable to high transportation, labor, land, or utility costs. Distribution is one such sector, and distribution centers that do not need to be near California markets or ports are increasingly likely to locate elsewhere. Freight mobility is a significant factor in such sectors.

Some of the perceived losses of economic activity and market share are resultant of exogenous logistics developments and strategies. Wider Panama Canal locks have reduced the cost of shipping from Asia to the East Coast versus the West Coast, and port market shares have shifted in response. As import volumes grow and import supply chains mature, importers have established multiple import routes and facilities, again reducing California's market share.

Many of the factors in state competitiveness are beyond the direct control of state government or state planning. Issues such as housing availability, cost of living, and market geography are driven by major long-term demographic and economic trends. While state government efforts may be warranted to blunt the most dramatic impacts on groups or industries at risk, the CFMP will not be able to reverse those demographic and economic trends. Workforce training is one area in which California can actively increase competitiveness.

Goods Movement Initiatives

The measures and initiatives that can improve California's competitiveness through increased capacity, reliability, and efficiency are the same as those that can improve performance for California's own needs:

- Highway capacity: Congestion in urban areas and on rural highways is the most frequently cited factor in poor California goods movement performance, and in freight transportation's impact on competitiveness. The standard tools of bottleneck relief and capacity increase may be augmented by effective IT solutions if and when they emerge.
- Seaport Capacity: California's ports, particularly the major container ports, have regularly added to their capacity and increased their productivity with relatively little state involvement. Unlike in most competing states, they are not state agencies. Yet if California wishes to compete more vigorously with other states, there may be a need for greater state support.

Economic Development Programs
California may need to link port and state economic development efforts and fund them at competitive levels to meeting competitive challenges from other states. Beyond the issues of transportation and development costs, California has not kept pace with logistics-based, transportation-linked economic development initiatives in competing states and nations, as in the case of Canada. The Ports of Georgia, Virginia, South Carolina, and Houston are state agencies and have been highly effective in attracting cargo growth and regional economic development. As local entities, California's ports lack statewide development responsibility and statewide development resources.

Local and regional economic development agencies can play an effective role in facilitating industrial and commercial development. There may be room to augment their traditional tools of tax concessions, site location and preparation help, etc. There can be a downside when inter-jurisdictional competition for development leads to concessions with adverse long-term impacts, such as allowing higher floor area ratings (FARs) that relegate truck parking to public streets.

Business Climate
Competitiveness is a matter of perception as well as reality, and – compared to other states – California is perceived to have little interest in attracting or keeping business. Businesses making location, production, distribution, and routing decisions compare costs and other tangible factors. Yet, they also hold their own perceptions of indifference or even hostility from communities, and of the difficulty of locating and operating in California, as external sources and studies affirm. Changing these perceptions may require significant "public relations" efforts linked to economic development programs.

Environmental and Building Regulations
As part of the State's efforts to improve freight mobility and competitiveness, the State may wish to examine environmental and other regulations, and the processes governing commercial and industrial development, to see if they can be streamlined without compromising their goals or effectiveness. While the rules and processes may be formulated by the State, they are implemented at the local level, and it is frequently at the local level where delays and uncertainty appear.

The cost, time, and uncertainty of developing or expanding facilities in California are primarily local or regional issues rather than a state government issue. Many local communities are legitimately concerned with the growth of transportation and distribution activity. Localities typically welcome the potential employment and expansion of the local tax base, but those benefits can be offset by unintended environmental impacts, like new traffic, emissions, and noise. Businesses attempting to build facilities may be met with open arms in other states' communities while it may perceive or experience organized community opposition in California. One major California-based industrial development company reported that visits from governors of other states encourage projects there, in contrast to a perceived indifference or hostility to projects within California.

Regulatory Stability and Predictability

Many stakeholders expressed concerns over what they see as frequent and unpredictable changes in California's regulations, specifically environmental regulations. Stakeholders in this and other studies have cited progressively restrictive clean air action plans by the CARB and the San Pedro Bay ports, which stakeholders claim have made some previous compliance investments obsolete. Here, too, the issue may be as much perception as reality, but the effect on competitiveness is the same. The State may wish to consider changes in regulations less often or communicate the nature and need for change more clearly to industry (although industry bears some responsibility for following and understanding the regulatory process).

Trade-offs

There is an implicit balance between economic development and environmental objectives in California's policies and funding choices. The tradeoff between environmental quality and economic growth is difficult to negotiate. In enforcing and strengthening California Environmental Quality Act (CEQA) requirements, CARB regulations, and other related measures, the State and its communities have made an implicit choice to accept the costs of a better environment. Those costs necessarily diminish California's short-term economic competitiveness with less restrictive locations but produce a better quality of life for Californians. That quality of life must be balanced against the need for employment and earnings security with California's high cost of living. California has many areas of high poverty, which are often very areas with environmental justice issues from nearby transportation activity.

California is not alone in environmental concerns. Federal emissions standards lag behind California's but have moved in the same direction. Congested urban areas throughout the country face emissions issues and will need to act. Other port areas now require clean trucks, and more will likely follow. In this regard, some of California's higher costs may be regarded as only near-term competitive disadvantages that may be reduced in the long run.

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Appendix D. National Highway Freight Network Mileage

Table D.1. California Primary Highway Freight System (PHFS) Route[1]

Route	Start Point	End Point	Length (Miles)
Dillon Rd	SR 86	I-10	1.51
Figueroa St	CA30P	I-110	0.17
I-10	I-405	I-5	13.03
I-10	I-710	CA/AZ Line	221.71
I-105	CA3A	I-605	17.39
I-110	SR 47	I-10	20.50
I-15	I-8	CA/NV Line	288.47
I-205	I-580	I-5	12.96
I-210	I-5	I-10	48.79
I-215	I-15	SR 30	46.25
I-238	I-880	I-580	2.16
I-305	CA34P	I-80	0.81
I-305	I-5	SR 99	2.14
I-40	I-15	CA/AZ Line	154.75
I-405	I-5	I-5	72.52
I-5	CA37P	I-8	3.21
I-5	I-805	CA/OR Line	772.38
I-580	U.S. 101	I-80	13.33
I-580	I-238	I-205	30.60
I-605	I-405	I-210	27.46
I-680	U.S. 101	I-580	29.59
I-710	CA29P	I-10	20.55
I-780	CA40P	I-80	6.62
I-8	I-5	0.17 Miles East of SR 67	15.92
I-8	SR 111	SR 7	7.14
I-80	U.S. 101	CA/NV Line	203.67
I-805	SR 905	I-5	26.67
I-880	U.S. 101	I-80	41.78
Miramar	I-805	I-15	5.15
SR 111	I-8	SR 78	14.32
SR 118	I-405	8.19 Miles West of I-405	8.19
SR 120	I-5	SR 99	6.34
SR 134	I-5	2.39 Miles East of I-5	2.39
SR 14	I-5	23.45 Miles Northeast of I-5	23.45

SR 170	U.S. 101	I-5	6.09
SR 22	I-405	I-5	9.88
SR 23	U.S. 101	6.85 Miles North of U.S. 101	6.85
SR 4	I-5	SR 99	3.37
SR 47	CA30P	I-110	2.08
SR 55	I-405	SR 91	11.84
SR 57	I-5	SR 60	16.22
SR 57	SR 60	I-10	3.12
SR 58	SR 99	5.71 Miles West of SR 99	5.71
SR 58	SR 99	I-15	129.84
SR 60	I-10	I-215	52.38
SR 60	I-215	8.95 Miles East of I-215	8.95
SR 7	MX/CA Line	I-8	7.19
SR 71	SR 60	3.63 Miles South of SR 71	3.63
SR 710	I-210	2.11 Miles South of I-210	2.11
SR 78	SR 111	SR 86	24.83
SR 86	SR 78	Dillon Rd	45.81
SR 905	MX/CA Line	I-805	6.73
SR 91	I-110	I-215	58.74
SR 99	I-5	I-305	298.14
U.S. 101	CA36P	I-5	64.14
U.S. 101	I-80	26.12 Miles South of I-680	74.31
U.S. 101	I-580	6.38 Miles North of SR 116	36.45
U.S. 50	SR 99	12.53 Miles East of SR 99	12.53
W Willow St	CA61R	I-710	0.89
		TOTAL	**3053.71**
Source: U.S. DOT Federal Highway Administration, 2017			

Table D.2. California PHFS Intermodal Connection

Route	Length (Miles)
Hollywood Burbank Airport	0.88
Port of Long Beach	3.38
Port of Los Angeles	2.85
Port of San Francisco	2.10
Port of Oakland	1.96
Port of Richmond	1.85
Port of West Sacramento	0.40
Port of Redwood City	1.26
Port Hueneme	20.45
Port of San Diego	3.13

Port of Benicia	2.30
Port of Stockton	1.28
Channel Islands Harbor	1.02
Lindbergh Field - San Diego	1.56
Los Angeles International Airport	1.02
Oakland International Airport	1.04
Ontario International Airport	1.06
San Francisco International Airport	0.61
Fresno TOPC Rail Yard	0.50
Long Beach (Carson) Rail Yard	0.70
Oakland Rail Yard	1.18
Lathrop Rail Yard	4.21
LA (Union Station)	1.54
Richmond Rail Yard	0.18
LA ATSF Rail Yard	1.41
Stockton Rail Yard	1.59
San Bernardino Rail Yard	1.73
City of Industry Rail Yard	0.99
UPS - Richmond Terminal	1.83
TOTAL	**64.01**
Source: U.S. DOT Federal Highway Administration, 2017	

Table D.2 California Non-PHFS Interstate Highway

Route	Start Point	End Point	Length (Miles)
I-10	Lincoln Blvd	I-405	2.94
I-10	I-5	I-710	3.26
I-215	Highland Ave	I-15 (North)	8.40
I-280	6th St	U.S. 101 (South)	57.32
I-305	I-5	Harbor Blvd	2.30
I-380	I-280	U.S. 101	3.01
I-5	MX/CA Line	Grape St	16.76
I-5	I-8	I-805 (North)	10.58
I-505	I-5	I-80	32.96
I-580	I-880	Grand Ave	2.88
I-580	0.31 Miles North of Fairmont Dr	I-238	2.15
I-580	I-205	I-5	15.66
I-680	I-80	I-580	40.96
I-8	0.17 Miles East of SR 67	SR 111	109.54
I-8	SR 78	CA/AZ Line	46.87

I-805	I-5 (South)	SR 905	1.25
I-880	I-280	0.13 Miles South of U.S. 101	3.97
I-980	I-880	I-580	1.83
		TOTAL	**362.64**
Source: U.S. DOT Federal Highway Administration, 2017			

Table D.3. California's Critical Urban Freight Corridors

Route	Begin Post Mile	End Post Mile	Length (miles)
SR 1	7.337	9.247	1.9
SR 47	3.529	4.565	8.2
103	0.055	1.752	2.5
5th St	NA	NA	1.7
Alabama St	NA	NA	1.6
Archibald Ave	NA	NA	0.9
Aviation Blvd	NA	NA	1
BNSF	NA	NA	0.25
BNSF & UP	NA	NA	0.25
California St	NA	NA	0.2
Century Blvd	NA	NA	1.5
Durfee Ave	NA	NA	0.19
Etiwanda Ave	NA	NA	3.3
Euclid Ave	NA	NA	4.7
Grove Ave	NA	NA	1.6
Harbor Scenic Dr	NA	NA	1.6
I-210	11.531	44.502	19.1
I-215	9.334	17.753	8.4
Jurupa Ave	NA	NA	4.2
Milliken Ave	NA	NA	3
Montebello Blvd	NA	NA	0.11
Mountain View Ave	NA	NA	1.3
Pier D St	NA	NA	1
Rice Ave	NA	NA	4.3
Riverside Ave	NA	NA	3.3
San Bernardino Ave	NA	NA	0.4
SR 111	3.227	1.181	2.42
SR 118	1.789	0.051	1.7
SR 118	18.208	19.981	3.09
SR 118	22.558	0.053	10.08
I-210	33.18	11.531	21.8

I-210	30.264	30.236	0.5
SR 57	20.874	20.884	0.34
SR 71	4.498	0.676	4.4
SR 74	1.062	2.134	1.1
SR 86	23.229	22.176	1.1
SR 98	31.821	32.46	0.6
Temple Ave	NA	NA	0.07
Tippecanoe Ave	NA	NA	2.8
Turnbull Canyon Rd	NA	NA	0.17
UP			0.6
U.S. 395	4.011	15.706	4.5
Churn Creek Road / Rancho Road	NA	NA	1.8
U.S. 101	12.275	9.233	3.09
SR 58	51.04	51.631	1.74
Pier B Street	NA	NA	1.6
Harbor Street	NA	NA	0.88
Port Road 5	NA	NA	0.21
Port Road 13	NA	NA	0.28
Port of Stockton Expressway	NA	NA	1.53
McCloy Avenue	NA	NA	1.27
Embarcadero	NA	NA	1.3
Humphreys Drive	NA	NA	1.01
Hooper Street	NA	NA	0.29
West Fyffe Street	NA	NA	1.33
Navy Drive	NA	NA	0.97
Washington Street	NA	NA	0.81
SR 132	19.007	19.033	0.91
SR 132	15.064	13.419	1.97
SR 108	30.364	34.333	2.69
SR 905	8.778	9.799	2.14
SR 905	9.801	11.717	2.27
SR 11 (Junction SR 905)	-	-	0.64
Enrico Fermi Dr	NA	NA	1.58
		TOTAL	**162.08**
Source: Caltrans, 2020			

Table D.4. California's Critical Rural Freight Corridors

Route	Begin Post Mile	End Post Mile	Length (miles)
SR 111	7.7	3.2	5.35
SR 118	20	22.54	2.54
SR 44	44	47	4.07
SR 89	29	30	0.99
SR 89	42.7	42.9	0.2
SR 89	28.5	29.5	1
SR 97	29.4	29.9	0.48
SR 299	17.2	18.293	1.04
SR 299	66.5	67.425	0.95
SR 395	14	16	2.03
CA SKYLINE	NA	NA	0.49
SR 89	27.3	27.4	0.11
SR 49	10.8	13.3	2.5
U.S. 395	29.94	42.08	12.14
SR 132	11.4	13.4	2
Faith Home Road	NA	NA	4
Fink Road	NA	NA	4.01
S. 5th Ave	NA	NA	0.09
SR 11	1	1.51	0.51
		TOTAL	**44.5**
Source: Caltrans, 2020			

Endnotes

[1] FHWA, National Highway Freight Network, 2018
https://ops.fhwa.dot.gov/freight/infrastructure/nfn/index.htm

Appendix E. Designation Process for Critical Urban Freight Corridor (CUFC) and Critical Rural Freight Corridor (CRFC)

In response to FAST Act requirements, Caltrans and MPOs need to collaborate and submit nominations to FHWA for the designation of Critical Urban Freight Corridors and Critical Rural Freight Corridors (CUFC/CRFC), which are part of the National Highway Freight Network (NHFN).[1] The NHFN is the focus of funding for the National Highway Freight Program (NHFP) and for federal grant programs such as FASTLANE and INFRA (for projects that support national goals identified in 23 U.S.C. 167(b) and 23 U.S.C. 117(a)(2)). The portion of the NHFN already designated by Congress is called the Primary Highway Freight Systems (PHFS) and the CRFCs and CUFCs are important freight corridors that provide critical connectivity to the PHFS. The purpose and intent of these CUFC/CRFC is provided in detail on the federal websites.

As noted in the federal guidance, there is no deadline for designating the CUFC/CRFC, and designations and de-designations will be on a rolling needs-based assessment. At any given time, California can have up to a maximum of 311 miles designated as CUFC and 623 miles as CRFC. FHWA recommends that Caltrans and MPOs work with the FHWA to develop an approach and timeline for identifying, tracking changes to, updating information on, and verifying the status of CUFC and CRFC roadways as part of the certification process.

This document describes the initial corridor designation process, assumptions applied for calculating miles, the rolling designation (or "on/off") process, and mileage methodology assumptions. Per the FAST Act, States are responsible for designating public roads in their state as CRFCs. In accordance with 23 U.S.C. 167(e), a State may designate a public road within the borders of the State as a CRFC if the public road is not in an urbanized area.

- In an urbanized area (UZA) with a population of 500,000 or more, the MPO in consultation with the State, is responsible for designating the CUFCs.
- In an urbanized area with a population of less than 500,000, the State, in consultation with the MPO, is responsible for designating the CUFCs.

Note that if a project is on the PHFS, no CUFC/CRFC designation is required. For others, the following CUFC/CRFC nominating process will apply.

Process for CUFC/CRFC Designation in California

To initiate the coordination process, Caltrans reached out to all regional partners in October 2016. First, Caltrans and its partners formed a Technical Working Group (TWG) which met over several months to agree upon a process for the ongoing/rolling designations. The TWG reached a statewide consensus that each MPO be provided a certain "initial target allocation" out of the 311 CUFC miles, with the flexibility of temporarily increasing their target allocation by "trading miles" with donor agencies based on needs. Caltrans facilitated the process. There is no regional "target allocation" for CRFCs and Caltrans will oversee statewide distribution of CRFCs working with all regional agencies. After reviewing several potential options for the target allocations for CUFC, the MPO subcommittee developed a formula based on a 75 percent weight for the urbanized area populations and 25 percent weight on the proportion of PHFS (see **Table E.1**).

Table E.1. CUFC Target Miles and Caltrans Role in Managing the CUFC Target Miles[2]

MPO	Target Miles
AMBAG	3.75
BCAG	0.69
FCOG	5.35
KCAG	0.62
KCOG	5.67
MCAG	1.96
MCTC	0.87
MTC	65.07
SACOG	18.18
SANDAG	28.67
SBCAG	2.64
SCAG	160.58
SJCOG	7.76
SLOCOG	1.23
SRTA	1.8
StanCOG	4.24
TCAG	2.69
California Total	**311.77**
Source: California Department of Transportation, 2017	

Caltrans Office of Freight Planning will develop a Statewide critical freight corridor inventory (Scoreboard) which will include:

- A publicly available GIS mapping and a database of all critical freight corridor mileage

- A historical record of designated and de-designated miles will be maintained in GIS

After the initial CUFC designation cycle, the TWG will reconvene every quarter to review the status of the freight network and may also update this guide as needed. The initial CUFC allocation in **Table E.1** is more of a target for the purposes of soliciting CUFC mileage nominations. There will likely need to be a trading process between regions that Caltrans should oversee.

GIS Process
Refer to this web page for detailed instruction on the GIS process:
http://www.dot.ca.gov/hq/tpp/offices/ogm/gisdata.html

CUFC "ON" Process
The MPOs identify needed CUFC miles based upon available target miles for each region and the need to apply those miles to a project for funding allocation or INFRA grant eligibility. The MPOs assign miles to a project when the CTC approves a project and obligates funds; the MPOs advise Caltrans of this and request concurrence.

Upon receipt of a concurrence letter (within 15 days of request), MPOs submit nominations directly to FHWA for urbanized areas (UZAs) with a population of 500,000 or more within MPO boundaries. For UZAs with population under 500,000, MPOs submit nominations to Caltrans for official submittal to FHWA. Caltrans adjusts CUFC target miles on the scoreboard.

NOTE: Although large MPOs are technically only responsible for designating miles within the UZAs with population of 500,000 or more, they will nominate ALL urban miles within MPO boundaries, and seek concurrence from Caltrans. Caltrans will provide concurrence based on statewide and interregional plans and policies, for both CUFC and CRFC nominations.

CUFC "OFF" Process
When project funding has been obligated (funds transferred), the MPOs can then de-designate those miles from its respective CUFC target allocation for the region. Caltrans adjusts the CUFC scoreboard accordingly.

CUFC "Swap" Process
When a loan of CUFC miles is negotiated from one region to another, Caltrans shall approve of the swap and indicate this swap on the publicly posted CUFC scoreboard. An official letter requesting the swap will be submitted to Caltrans, followed by an official response from Caltrans.

CRFC Process
Statewide, the 623 CRFC miles will be managed by Caltrans as part of the assignment process. The "need" for CRFC designations, based on an initial call for shovel-ready projects, is estimated to be much less than the miles allocated to California. Therefore, Caltrans has proposed a list of criteria to prioritize corridors (if CRFC mileage needs are more than the federally allocated 623 miles).

CRFC Assignment
The large MPOs and the smaller MPOs similarly submit their CRFC requests to Caltrans. Caltrans then submits requests to FHWA California Division Office. Caltrans maintains a CRFC scoreboard similar to the CUFC Scoreboard

Mileage Methodology and Assumptions

Interchanges
If one of the interchange roads is on the PHFS, no additional miles are required for this interchange project. This includes reconfiguring ramps, widening an overcrossing, signalizing ramps, and/or adding connections to reduce weaving which will improve operations for the mainline, particularly if congestion on the ramps/non-PHFS crossing causes queues to extend onto the PHFS. This is consistent with clarification that FHWA provided at the April 3, 2017 meeting of the TWG.

If neither of the roads is on the PHFS, the project sponsor should measure the distance on the mainline segment that corresponds to the largest project "footprint." For example, if the interchange project includes adding a new lane on one of the highways in addition to ramp modifications, the CUFC/CRFC would correspond to the distance of the widening component of the project. Per the logic for an interchange on the PHFS, only one of the intersecting roads needs to be designated as a CUFC/CRFC.

- If an interchange project includes significant mainline widening, the portion of the widening beyond the extent of the interchange would need to be designated as a CRFC/CUFC.
- If the interchange is on the PHFS, then the interchange would be exempt, and mileage would only be assigned to the widening portion of the project beyond the interchange extents on a non-PHFS route.

New Roadway Alignment Projects
Projects that would construct new alignments should use the mileage of the new alignment for designating a CUFC/CRFC. If the new alignment is planned to replace a route currently designated as part of the PHFS, no mileage is needed to be assigned to this project.

Roadway Projects Crossing Urban/Rural Boundaries
The urban portion of the project would be assigned CUFC and the rural portion of the project would be assigned CRFC mileage.

Port Projects
Statewide, port projects (seaport, airport, land port) cannot amount to more than 10% of the State's entire FAST Act Formula funds. No CUFC miles should be assigned.

ITS Projects/Non-Traditional Projects/Emission Reduction Projects
Intangible operational improvements such as ITS projects, incentives for near-zero emission technology or upgrading truck scales do not require CUFC/CRFC miles.

Grade Crossing Improvements
Grade crossing improvements like safety measures associated with implementing rail quiet zones and multimodal infrastructure at rail crossings are not roadway projects. No CUFC/CRFC miles should be assigned.

Grade Separation Projects
If the project would separate rail from a roadway that is already the PHFS, no CUFC/CRFC miles should be assigned. This is consistent with clarification that FHWA provided at the April 3, 2017 meeting of the TWG. If the project would separate rail from a roadway off the PHFS, the non-PHFS roadway would need to be designated as CUFC/CRFC and mileage should be measured along the length of the project footprint. In both cases, rail grade separation needs no CUFC/CRFC.

Endnotes

[1] "Fast Act, Section 1116 National Highway Freight Program (NHFP) Guidance: Designating and Certifying Critical Rural Freight Corridors and Critical Urban Freight Corridors." U.S. Department of Transportation, Federal Highway Administration. April 26, 2016. Ops.fhwa.dot.gov/fastact/crfc/sec_1116_gdnce.htm.

[2] Unpublished document. California Department of Transportation. "Critical Urban/Rural Freight Corridor Designation Process" Handout. 2017.

Appendix F. Bi-National and Multistate Corridor Efforts

California is an active member of many bi-national, multistate, and multimodal corridor initiatives that include the identification, planning, and implementation of corridor management and operational strategies that improve the effectiveness and efficiency of freight and passenger movement. The goal of these efforts is to bring states together to cooperatively and collaboratively plan, manage, rehabilitate, and fund the capital and operational improvements needed to operate and maintain select nationally significant freight corridors. These efforts consist of the United States-Mexico Joint Working Committee (JWC), United States-Mexico Binational Bridges and Border Crossings Group (BBBXG), Interstate 10 Corridor Coalition (I-10), 15 Mobility Alliance (I-15 MA), Interstate 15 Freight Mobility Enhancement Plan (I-15 MEP), Western States Freight Coalition (WSFC), West Coast Collaborative - Alternative Fuel Infrastructure Corridor Coalition (WCC-AFICC), and Marine 5 Highway (M-5) Corridor.

Bi-National Efforts

The JWC and BBBXG are the primary bi-national efforts between the United States and Mexico to improve efficiency and effectiveness, align priorities of the Ports of Entry (POEs), and facilitate transportation across the international border.

United States-Mexico Joint Working Committee

The JWC facilitates efficient, safe, and economical cross-border transportation movements and cooperates on land transportation planning. The JWC promotes effective communication and coordination, analyzes current and future transportation infrastructure needs, and evaluates transportation demand and infrastructure impacts. The JWC is working with partner agencies to create border-wide regional master plans that encompass comprehensive and prioritized assessment of transportation needs along the border that include POEs. The group is mostly comprised of transportation professionals from the FHWA, Mexico's Secretariat of Communications and Transportation and includes representatives from the U.S. Department of State, Mexican Ministry of Foreign Affairs of Mexico (Secretaría de Relaciones Exteriores), four U.S. border states DOTs, and six Mexico border States.

United States-Mexico Binational Bridges and Border Crossings Group

The BBXG is a forum for a bi-national effort to manage the planning, construction, and maintenance of planned, ongoing, or new border crossing projects and POEs along the 1,952-mile U.S.-Mexico border. The purpose of BBBXG's semi-annual meetings is to discuss operational matters involving existing and proposed bridges, border crossings, related infrastructure, and to exchange views on policy and technical information. Related issues involving facilitation of travel between the two countries, such as border region highways and other infrastructure projects are also discussed. The BBXG is co-chaired by the Department of State and the Mexican Ministry

of Foreign Affairs of Mexico and is attended by federal agencies with an interest in border crossings. The ten U.S. and Mexican border states are active participants in these meetings.

Multistate Efforts

Interstate 10 Corridor Coalition

The Interstate 10 Corridor Coalition connects people, businesses, and services across multiple states. Arizona, California, New Mexico and Texas formed the I-10 Corridor Coalition in 2016. The goal being to work together using Intelligent Transportation Systems (ITS) and communications to create safer and more efficient travel for goods and people along a corridor stretching from California through Texas and eventually coast to coast. This includes determining the best ways to create seamless commercial vehicle inspection and permitting operations across the four states and to find the most economical way to complete corridor-level ITS projects.

The I-10 Corridor Coalition is committed to multi-jurisdictional coordination organized around a common vision and is facilitated through a cooperative support structure. The I-10 Corridor Coalition's vision is to create one connected corridor throughout the four states. This corridor utilizes the transportation expertise of the states collectively to enable resource sharing, joint testing, and economies of scale, while applying best practice protocols to improve safety and efficiency, improve freight and passenger movement, expand and coordinate the use of technology along the corridor, and promote cooperative planning.

Interstate 15 Mobility Alliance

The I-15 Mobility Alliance was a multistate cooperative alliance between California, Nevada, Arizona, and Utah that was established in 2011 to develop a comprehensive multimodal plan to prioritize projects and policies of interregional significance, and to guide appropriate governance mechanisms for the on-going efficient and effective construction, operation, and maintenance of the I-15 Corridor. The effort resulted in the development of the 2012 Interstate 15 Corridor System Master Plan and the Interstate 15 Corridor System Master Plan 2017 update. The cooperative agreement between the states has expired and the Nevada Department of Transportation (NDOT) is in the process of renewing the alliance through a new cooperative agreement between California, Nevada, and Utah.

Interstate 15 Freight Mobility Enhancement Plan

The I-15 Freight Mobility Enhancement Plan (MEP) is a multistate truck parking study led by Nevada DOT and funded through a federal National Economic Partnerships for Innovative Approaches to Multi-Jurisdictional Coordination grant. The purpose of the grant is to fund and implement innovative approaches to multi-jurisdictional coordination and regional planning (e.g., megaregion planning). The purpose of the study is to define truck parking issues at a multistate level, focus on local and regional truck parking challenges, and to identify actions that partner agencies can implement at the regional level.

Western States Freight Coalition

The Western States Freight Coalition (WSFC) is a voluntary partnership of state DOTs from California, Arizona, Colorado, Idaho, Oregon, Nevada, New Mexico, Washington, and Utah, which are committed to multi-jurisdictional coordination, organized around a common agenda, and facilitated through a cooperative support structure. The WSFC mission is to facilitate, through multistate coordination, efficient, safe, sustainable, and forward-looking multimodal freight transport across the Western U.S. that fosters economic opportunities.

In the last year, the WSFC heavily focused on addressing truck parking issues and sharing information on how each state was addressing needs in its state. Recently, the Western Association of State Highway and Transportation Officials (WASHTO) voted to form a freight committee. Given this recent development, it is likely that the WSFC will disband and join the new committee with the other member states and Canadian provinces of WASHTO.

West Coast Collaborative- Alternative Fuel Infrastructure Corridor Coalition

Caltrans is an active partner in the West Coast Collaborative - Alternative Fuel Infrastructure Corridor Coalition (WCC-AFICC), a partnership between California, Oregon, and Washington that seeks to accelerate the modernization of west coast transportation corridors by deploying alternative fuel infrastructure for medium and heavy-duty vehicles. The Coalition is in the process of finalizing and implementing its Strategic Plan.

Marine Corridors

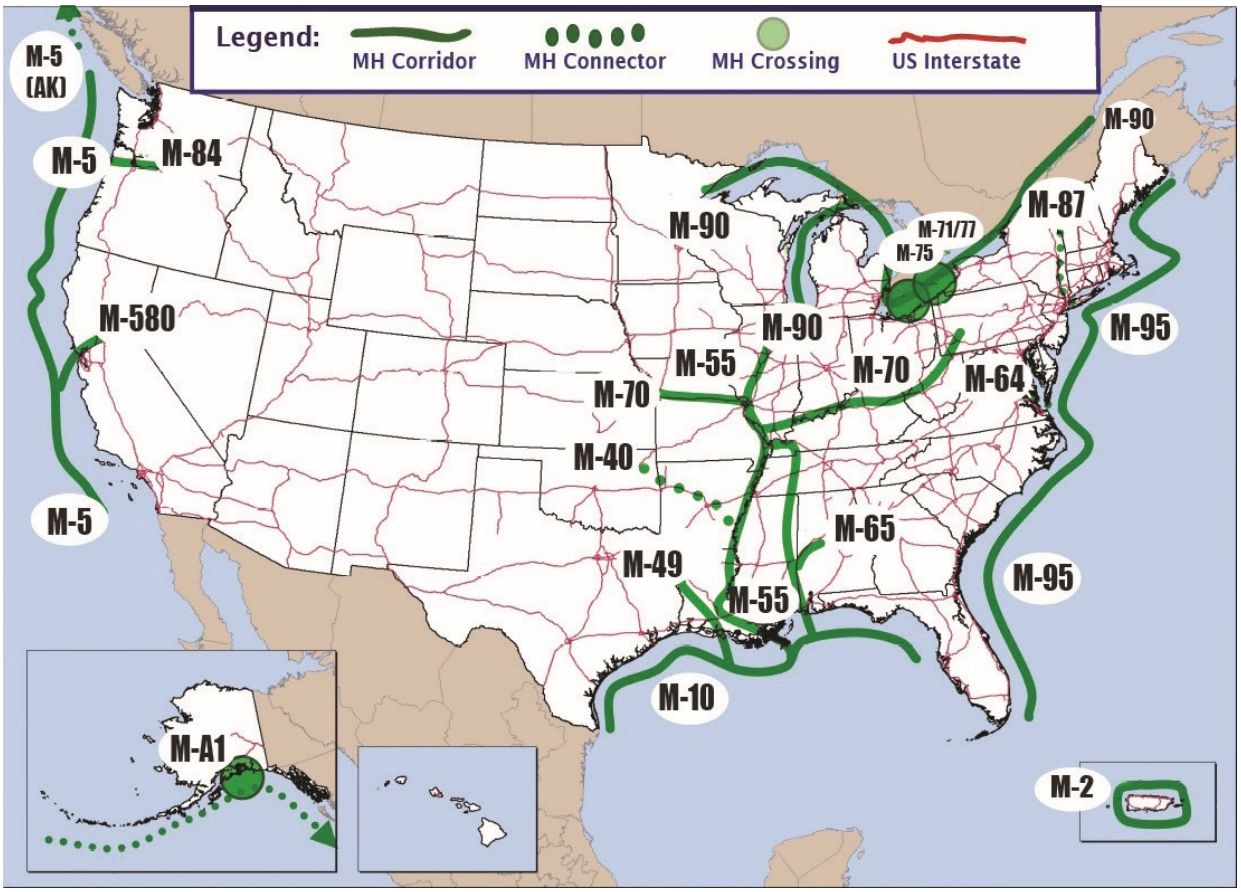
Marine 5 Highway Corridor

California has been exploring the use of marine highways consistent with the America's Marine Highway Program developed by the U.S. Department of Transportation's Maritime Administration (MARAD). This allows freight to be shipped between ports and harbors using navigable waterways in lieu of landside highway and rail facilities. Marine highways could potentially alleviate rail capacity and ultimately reduce the amount of truck trips on congested parallel highways furtherer reducing freight-related GHG emissions.

Marine 5 Highway Corridor (M-5) this the only multistate Marine Highway. MARAD is working with the western states of California, Oregon, and Washington to explore its development for the purpose of alleviating freight movements and congestion along I-5 from the California–Mexico border region in San Diego to the U.S.–Canada border north of Seattle, Washington. **Figure F.1**. shows proposed U.S. marine highway routes.

In 2014, the West Coast Corridor Coalition sponsored the M-5 Corridor Study to determine the market and operational viability of marine highway services on the west coast. The study investigated if M-5 services were economically and operationally attractive to shippers and able to obtain sufficient cargo volumes in the marketplace. Operational, utilization, and cost parameters for six potential marine highway services were developed for the study.

Figure F.1. America's Marine Highway Routes



Source: U.S.DOT Maritime Administration, 2019 (https://www.maritime.dot.gov/grants/marine-highways/marine-highway)

Appendix G. Truck Technology Types

Dual-Mode Hybrid & Plug-In Hybrid Electric Vehicle

This vehicle is an advanced parallel hybrid with the internal combustion engine as the main source of power. The technology is moderately mature with little to no changes in operations compared to a diesel-operated truck. The actual ZE range is limited, as it only functions in ZE mode at low speeds and/or is subject to certain load limits. Unlike the Hybrid Electric Vehicles (HEVs), the Plug-In Hybrid Electric Vehicles (PHEVs) have batteries that are recharged through the electrical grid. Recharging is becoming faster and charging locations are becoming more prevalent. PHEVs can operate in ZE mode for longer distances than HEVs. These trucks achieve approximately 15 percent emissions savings compared to conventional diesel trucks.

Range-Extended Electric Vehicles with Integrated Engine

These vehicles can use either electric power or diesel fuel, but the primary source of energy is the electric motor. The engine can run either on diesel or compressed natural gas (CNG) when the batteries are depleted. The determining factor for ZE range is battery size. Therefore, this truck type can be designed for specific ZE ranges as needed, subject to corresponding changes in cost. These trucks achieve approximately 25 percent emissions savings compared to conventional diesel trucks.

Range-Extended Electric Vehicles with Integrated Fuel Cells

This technology is analogous to the Range-Extended Electric Vehicles (REEV) with integrated engines, except that it relies on a fuel cell in place of an integrated engine when the vehicle battery is depleted. The fuel cells require hydrogen refueling stations for recharging, making these trucks a practical solution only in areas where such refueling stations exist. The technology can be designed to fit within tight spaces and can be accommodated by a standard diesel truck, but it comes at a higher price point compared to other technologies. These vehicles also offer relatively long useful lifespans and small maintenance costs. This technology is already available on the market. These vehicles can operate in true zero-emissions mode making it is relatively easy to obtain regulatory certification for them.

Battery Electric Vehicles

The Battery Electric Vehicle (BEV) is an electric-only vehicle powered by its battery alone, meaning that longer ranges require larger, heavier, more costly batteries. The vehicle batteries can be recharged using dedicated recharging stations or overhead/in-pavement catenary power systems (if the vehicle is properly equipped to draw power from such a source). Recharging of the internal battery requires more time than refueling a REEV fuel cell or internal combustion engine. Alternatives to on-road charging include battery exchange. Battery exchange is currently being used in port environments, such as the Port of Long Beach's Middle Harbor Terminal, which uses battery exchange to continuously power Automated Guided Vehicles

(AGV) that move cargo throughout the terminal. Full-electric trucks require larger batteries than HEVs and typically weigh more. HEVs have a longer range, but as battery technology continues to improve some EV trucks have demonstrated travel ranges of 200 miles. One of the major disadvantages posed by EVs is cost. The batteries for full-electric trucks currently add approximately $100,000 to the vehicle price. These vehicles can operate in true zero-emissions mode making it is relatively easy to obtain regulatory certification for them.

Range Extenders Utilizing Roadway Power

New truck technologies require roadway infrastructure to charge the electric trucks while on route using technologies that are already widely used for transit vehicles. This technology allows for smaller, cheaper on-board batteries and therefore lower vehicle costs as well. This cost savings per vehicle is offset by significantly greater costs for infrastructure supporting systems relative to other ZE/NZE technologies. These vehicles can operate in true zero-emissions mode making it may relatively easier to obtain regulatory certification for them.

For more information and status for each truck technology type, please refer to ARB's Heavy-Duty Investment Strategy located at https://ww2.arb.ca.gov/sites/default/files/2019-09/fy1920fundingplan-appd.pdf.

Appendix H. Outreach and Engagement Efforts

During the development of the CFMP 2020, various outreach efforts, such as public workshops, public outreach, and a digital outreach strategy via Facebook were conducted in order to better identify and understand the freight-related concerns of California residents. The main focus was to gather feedback from a diverse set of demographic populations and geographic regions. Primary communities of focus were:

- **Rural Communities** - Rural communities tend to be isolated, which often leads to fewer supply chain transportation routes in their community. Lack of modern freight infrastructure makes it challenging to move goods into, thorough, and out of these communities.
- **Urban Communities** - Urban communities experience congestion from the many supply chain tranportation routes traversing their communities. On the other hand, they also experience a great benefit from the proximity of the supply chain.
- **Native American Tribes** – There are roughly 109 Indian tribes in California. Some are near highly populated metropolitan areas, while others are located in the mountains of Northern and Eastern California. Native American concerns are a priority for the State. Quality feedback regarding Tribal needs provided during targeted outreach informed the development of the CFMP 2020.
- **Environmental Justice Communities** – Outreach to these communities was essential, given the disproportionate impacts on air quality, public health, and social inequity freight movements created in these areas. Outreach was focused on communities that were classified under AB 617 and identified by CARB to participate in the Community Air Protection Program (CAPP). AB 617 was created in an effort to reduce health impacts from nonvehicular air pollution and is supported by an extensive emissions database and air monitoring networks. CAPP will develop and implement focused actions to improve overall air quality for these selected communities. Including feedback from these communities was extremely vital to the overall creation and future implementation of the CFMP.

Outreach Activities

Public Workshops and Outreach Activities

Caltrans hosted two public workshops during the CFMP development. The Southern California Introductory Public Workshop was held in Diamond Bar on May 17, 2018 and the Northern California Introductory Public Workshop was held in West Sacramento on June 6, 2018. In both workshops, participants were given an overview of the CFMP and were asked to discuss: how they interacted with freight, how they benefitted from freight, how they were impacted by freight, and what types of investments they would like to see regarding freight in their respective communities. To promote participation in the workshops, more than 1,200 email

invitations were sent, over 100 personal phone invitations were made, and numerous organizations invited their entire memberships (estimated in the hundreds).
Public Outreach was conducted at five different events throughout California. These events were staggered in order to conduct outreach both before and after the draft plan was released.

These events included the following:

- California Transportation Planning Conference in San Diego from February 23-25, 2019
- Kool April Nights in Redding on April 27, 2019 from 7am-4pm
- CicLAvia in Wilmington on April 28, 2019 from 9am-4pm
- Downtown Farmers Market in San Luis Obispo on May 23, 2019 from 6pm-9pm
- Portside Environmental Justice Steering Committee Meeting in San Diego on September 24, 2019 from 6pm-8pm

Caltrans staff created innovative ways to engage people at these events to spark their interest in freight, such as asking how far they thought a banana traveled on average to reach their grocery store. Once the public was engaged, staff proceeded to converse with them about freight issues in California and encouraged participants to share how freight affected them and their communities. Some of the prominent questions we asked, and themes we noticed from these conversations included the following:

- What impacts from freight do you observe in your community?
- How do you interact with freight in your community?
- What benefits from freight do you observe in your community?
- What freight investments should be made in your community?

Caltrans staff invited participants to take a 10-question survey on provided iPads. If they declined, staff offered a CFMP business card which included a QR code. Once scanned, this code would direct them to the freight survey, which they could complete on their own. Additionally, Caltrans created mailers with the questions listed above for people to fill out and mail back. Conducting public outreach proved to be much more effective than the two public workshops, as these events allowed Caltrans staff to speak with a larger number of people from a diverse range of backgrounds.

Public Survey

1. How many shipments do you receive each month from online retailers like Amazon, Walmart, Wayfair?
    - 1-2
    - 3-5
    - 6-10
    - More than 10

2. Where are these shipments delivered?
    - Home
    - Work
    - Amazon Box
    - Other

3. How do you experience the merchandise movement activity in your community?
    - Cargo trains at rail crossings
    - Semi-trucks on major highways
    - UPS/FedEx trucks in your neighborhood
    - Industries such as manufacturing/distribution in your city

4. Rank which good move below benefits your community the most. (1st Most Beneficial)
    - Higher tax revenues
    - High number of jobs
    - Faster economic development
    - Higher house prices
    - Access to a larger market through online shopping

5. Classify the following items in order for the biggest truck traffic impact in your community. (1st Biggest Impact)
    - Truck traffic congestion
    - Health impacts and air pollution
    - Acoustic pollution
    - Truck/driver safety (sharing the public road)
    - Truck-damaged road/pavement

6. Have you ever had to move due to negative freight impacts?
    - Yes, my house
    - Yes, my work
    - Yes, my children's school
    - No

7. What projects do you think should be a priority in your community?
    - Safety projects at the rail crossing
    - Alleviating truck congestion
    - Improving air quality
    - Created goods movement work/job training programs
    - Increasing the use of alternative energies
    - Increased flexibility in out-of-hours and nighttime delivery

8. Did you participate in the development of the 2014 California Cargo Mobility Plan (CFMP)?
    - Yes
    - No
    - I do not know

9. What motivated you to participate today?
    - I want to learn more
    - I want concerns about the impact of freight on my community
    - I think freight can benefit my community
10. Provide additional feedback.

Industry Focus Groups

The six focus groups in *Bakersfield, Oakland, San Bernardino, Stockton, Redding, and Los Angeles* each began with the same general agenda topics: Competitiveness, Technologies, Workforce, Sustainability, Projects. For each topic, the team asked participants specific questions to solicit views of major groups with similar interests. The questions are listed below under their corresponding topics:

Competitiveness:

- How does the cost of freight transportation in California affect your ability to grow and to compete with non-California firms or locations?
- What can Caltrans and other state agencies do to lower those barriers?
- How should we measure freight transportation's impact on California's Competitiveness for new jobs or market share?
- Do you have data or other information that would be helpful?

Technologies:

- What technologies do you see as most promising for your business?
- What should the State do to encourage or enable new freight transportation technology?

Workforce:

- Do you expect to have the workforce you need to operate and grow in the future?
- What workforce shortfalls have you experienced, or do you expect?
- What can the public and private sectors do to develop the workforce we need?

Sustainability:

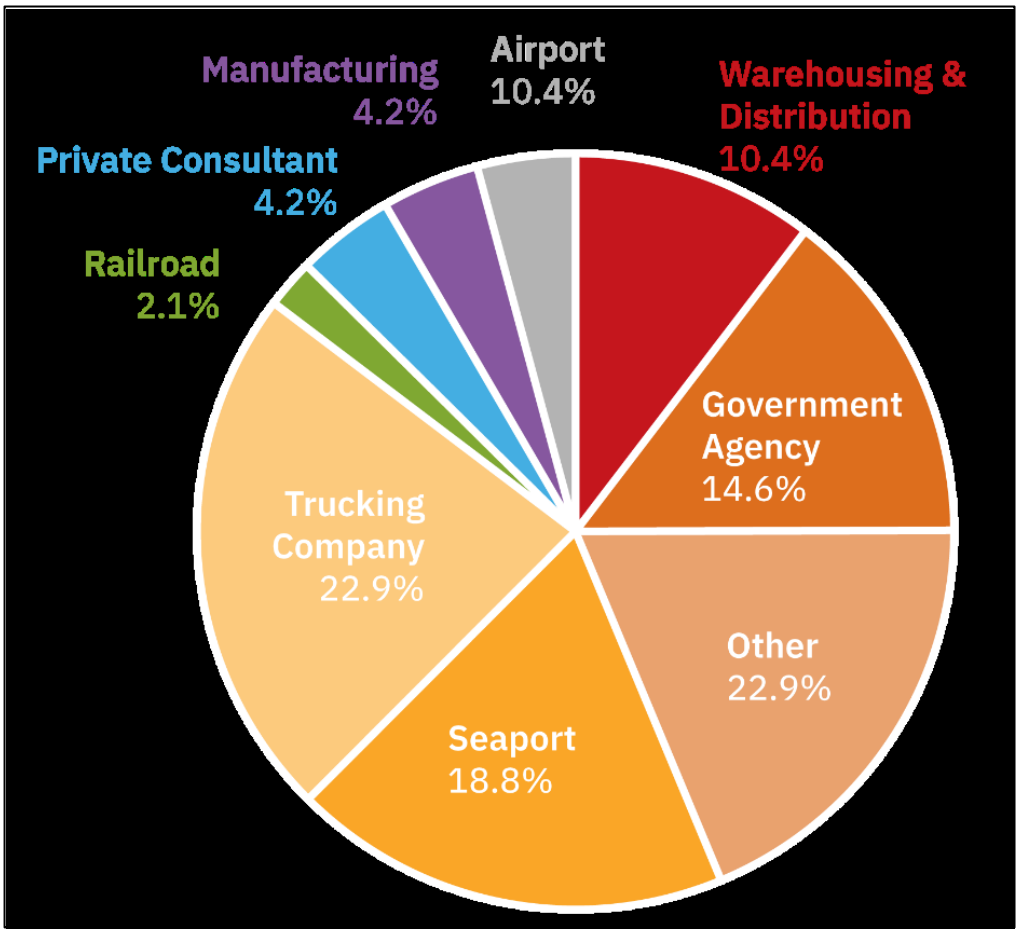
- If we define sustainability as including operations, economics, environmental impacts, and social impacts, what do you see as the challenges to achieving sustainability for your business in California?
- What should Caltrans and the State of California do to help you achieve sustainability?

Projects:

- What California infrastructure projects or programs are most important to your business?
- What are the most important criteria Caltrans should use in evaluating freight projects or programs?
- How should Caltrans measure progress against those criteria?

Industry Interviews

Major industry stakeholders such as trucking, ports, railroads, and industry associations were interviewed with the same questions as the industry focus groups. Like the Industry Focus Groups, questions fell under the following themes: Competitiveness, Technologies, Workforce, Sustainability, and Projects.



Industry Survey

An online survey was created and distributed via email to freight stakeholders from the Public and Private sectors throughout the state. There were 106 respondents categorized as shown below:

Fifteen substantive questions and 3 identification questions were asked. Questions are listed below:

1. How does the cost of freight transportation in California affect your ability to grow and to compete with non-California firms or locations?
2. What can Caltrans and other State agencies do to increase your competitiveness?
3. What elements do you think we should consider when measuring freight transportation's impact on California's competitiveness?
4. What new technologies or innovative programs do you currently have or will deploy within the next few years?
5. If you are not currently, or do not plan to deploy any new technologies or innovative programs from Question 4, what are the biggest barriers?
6. What technologies do you see as most promising for your business?
7. What should the State do to encourage or enable new freight transportation technology?
8. What type of workforce shortfalls have you experienced, or do you expect to encounter in the near future?
9. What can the public sector do to develop the workforce we need?
10. What can the private sector do to develop the workforce we need?
11. If we define sustainability as including operations, economics, environmental impacts, and social impacts, what do you see as the challenges to achieving sustainability for your business in California?
12. What are the best opportunities to reduce energy consumption in your business?
13. What California infrastructure projects or programs are most important to your business?
14. What are the most important criteria in evaluating freight projects or programs?
15. What other issues should the California Freight Mobility Plan address?

Digital Outreach and Social Media Survey

An online survey tailored specifically for the public was created and distributed via mailers, business cards, and Facebook (described below).

The Digital Outreach effort was designed to gather information through Facebook from specific, targeted groups throughout California. Caltrans began this effort by running a test Facebook post through the Caltrans Headquarters main Facebook page which allowed Facebook users two ways to take the survey:

- via the Caltrans Facebook Page,
- via a “boosted” post on targeted users’ newsfeeds

The boosted post reached from 1,200 to 4,400 persons for 7 days within the Moreno Valley and Oakland areas who associated with certain lifestyles and interests (parenting, online shopping, travel, education, retail shopping, etc.). The post allowed targeted users to voluntarily access a

link directing them to the CFMP survey on Constant Contact's digital platform. Caltrans staff found that they were able to engage thousands of people in a short amount of time for a very low cost through Facebook.

After the test proved to be effective, Caltrans created six additional Facebook posts unique to different geographic areas that included compelling information about goods movement, freight industry facts, and other posts seeking the general public's needs when it comes to freight. These six targeted communities were: Long Beach, Ontario, Moreno Valley, Bakersfield, San Pedro, Oakland, and Redding. All posts included a call-to-action which motivated the audience to complete the CFMP survey to help improve freight mobility in their respective communities.

Survey Results

As mentioned above, a main component of the outreach efforts included the CFMP survey. In this survey, respondents were asked nine questions regarding the impact of freight in their lives and communities. Approximately 40 members of the public took the survey via the Facebook posts. The survey was not scientific but did provide a qualitative assessment of how the public who uses Facebook feel about freight in California.

This survey served as a useful tool to gather information regarding freight related issues in various communities. When respondents were asked about their participation in the development of the 2014 CFMP, 62 percent said they did not participate at all and 32 percent of respondents said they were motivated to participate now so they could learn more and understand the concerns about freight impacts in their respective communities. Not only did this survey allow Caltrans to gather important information regarding public perceptions of freight, the digital outreach effort was able to increase public participation in the development of this plan and create awareness surrounding freight related issues statewide.

Appendix I. Safety, Security, and Resiliency

The freight system is a complex network that is susceptible to natural disasters and human-caused events. Whether the result of natural processes, accidents, criminal activity or terrorism, freight system disruptions can have devastating consequences. California's economy is dependent on the strength, reliability, and resiliency of its freight sector. Disruptions may impact the economic health of individual companies, communities, regions, the State and nation. California needs to ensure that the freight transportation system prevents and minimizes negative impacts from such events and quickly recovers when they occur. California's freight system needs to be particularly adaptable so that emergency supplies can be transported and distributed when and where they are needed.

Emergency Support Functions

The State of California is prepared to respond quickly and effectively to large-scale safety and security events on a 24-hour basis. When an event or potential event is first detected, the California Office of Emergency Services (Cal OES) is activated to a level appropriate to the magnitude of the threat. All state agencies and volunteer organizations that comprise the State Emergency Response Team (SERT) are grouped into 18 Emergency Support Functions (ESF) to carry out coordination and completion of assigned missions[1]. These functions represent specific response activities that are common to all disasters. Each ESF is comprised of one or more primary agencies serving as the lead and several other agencies and organizations providing support. The State-level ESF 1 activities support the coordination of transportation across various modes, including surface, maritime, railroad, aviation, and pipeline.
The ESF 1 lead agency, CalSTA, has delegated to the CHP and Caltrans, the responsibility to provide expertise primarily for surface transportation, and has identified stakeholders from primary and supporting agencies to take the coordination lead for other modes of transportation[2]. According to the State of California Emergency Plan, ESF 1 – Transportation, "assists in the management of transportation systems and infrastructure during domestic threats or in response to incidents." ESF 1 also provides recommendations and subject matter expertise to Cal OES including ESF 1 preparedness, mitigation, response, and recovery.

Caltrans specific responsibilities directly related to ESF 1 activities:

- As the owner operator of the state highway system (SHS), has administrative orders to repair, maintain and operate the SHS during and following emergencies and disasters;
- Provide assessments of transportation infrastructure and traffic conditions;
- Assess damage to highway system and establish route priorities during recovery efforts;
- Operate as the liaison to the U.S. DOT and FHWA regarding the status of the SHS;
- Provide transportation policies and guidance as needed;
- Coordinate state agency plans, procedures and preparations for route recovery, traffic regulation and air transportation; and

- Develop routing and directions for the movement of incident victims out of an impacted area and for the delivery of necessary personnel and medical supplies to local medical facilities and shelters.

CHP specific surface transportation responsibilities:

- Act as the Director of the State Motor Transport Division during times of emergency;
- Perform tasks assigned in the California Emergency Resources Management Plans for transportation during times of a war emergency;
- Continue emergency traffic regulation and control procedures as required;
- Assist Caltrans with traffic route restoration;
- Provide police escorts on closed routes;
- Activate appropriate CHP Emergency Resource Centers to coordinate resources and ensure the timely dissemination of intelligence information;
- Secure routes, regulate traffic flow, and enforce safety standards for evacuation and re-entry into evacuated areas;
- Coordinate interstate highway movement on regulated routes with adjoining states;
- Establish highway safety regulations consistent with location, type and extent of emergency conditions; and
- Support Caltrans with traffic route re-establishment and continued emergency traffic regulation and control procedures as required.

Hazardous Materials Transport[3]

Industrial hazardous materials that are flammable, corrosive, toxic, explosive, or infectious play a vital role in the U.S. economy. They are used by industries from farming and mining to manufacturing and pharmaceuticals, and come in the form of raw materials, fertilizers, fuels, constituent parts, and other essential inputs. Of all hazardous materials, Toxic Inhalation Hazard (TIH) chemicals are among the most dangerous. Chlorine gas and anhydrous ammonia are the most common TIH chemicals; others include sulfur dioxide, ethylene oxide, hydrogen fluoride, and a variety of other products that are important manufacturing inputs. The potential consequences of a TIH release depend on the severity of the accident or event.

One widely discussed risk-mitigation proposal involves re-routing trains containing TIH tank car loads, for example, by choosing a route with less population exposure. TIH tank cars passing through major population centers were recognized as potential chemical weapons. Proponents of mandatory re-routing of TIH products argued that diverting trains around cities would place fewer people at risk of a terrorist attack and/ or collisions.

Many hazardous chemicals transported over long distances by rail, and for shorter distances by truck, may be particularly vulnerable to sabotage and disruption. At the federal level, the U.S. DOT and Transportation Security Administration (TSA) have sought to reduce the risk of terrorist attacks on freight. TSA worked with railroad carriers to implement a security program, the TIH Risk Reduction Program. TSA assumes that the risk of hazardous materials transport is directly proportional to the dwell time (the length of time that a rail car sits at a particular location), volume, and type of materials transported through densely populated areas. First

implemented in New Jersey and New York, the program seeks to establish secure storage areas for TIH materials and to expedite their movement through the system.

Rail Freight

California has increased state-level oversight of rail freight and strengthened the regulation of railroad security. In addition to its role enforcing federal rail safety regulations, the California Public Utilities Commission (CPUC) is developing the capacity to improve rail security. The CPUC was charged with enforcing the provisions of AB 3023 requiring railroad operators to conduct risk assessments of their facilities and to develop and implement infrastructure protection programs. CPUC has more than 40 federally certified inspectors who are authorized to issue security enforcement recommendations under the auspices of federal law. Additionally, California actively seeks to bring State-level knowledge regarding rail safety and security to short line rail carriers that may not have the resources to establish robust safety and security programs on their own.

Positive Train Control Program
Positive Train Control (PTC) systems are integrated command, control, communications, and information systems for controlling train movements with safety, security, precision, and efficiency. PTC systems improve railroad safety by significantly reducing the probability of collisions between trains, casualties to railway workers, damage to equipment, and overspeed accidents. The system can recognize a threat of collision or accident and slow or stop a train automatically to avoid the incident. The National Transportation Safety Board (NTSB) has named PTC as one of its "most-wanted" initiatives for national transportation safety.
The Rail Safety Improvement Act of 2008 required all Class I railroads (the largest) and intercity passenger and commuter railroads to implement a PTC system on mainline track that carry passengers or TIH materials by December 31, 2015. Currently PTC is completely implemented in all Class I railroads in California.

Trucks

Trucks can weigh more than 30 times more than passenger vehicles and requires more stopping distance, especially when loaded. When involved in a collision, the size and weight of large trucks increase the severity of impact when a passenger vehicle is involved. Furthermore, truck crashes are more likely to result in severe injuries or fatalities than those involving only passenger cars. For example, between 2013 to 2017, the number of collisions involving trucks increased by 23 percent. Also, during this period, statewide truck VMT increased by 15 percent, followed by an overall increase in the number of collisions per one million VMT. However, commercial truck collisions resulting in no injury or death increased only by 4 percent and injuries by 24 percent, though the number of commercial truck collisions resulting in a fatality decreased by 8 percent.

Another safety concern is distracted driving and driver inattention. A distraction is anything that diverts the driver’s attention from his or her primary tasks of navigating the vehicle and

responding to critical events. According to an in-cab driving study of commercial truck drivers by the Virginia Technical Institute, the most dangerous distraction observed was texting. Truck drivers who texted while driving had 23 times the risk of being involved in a crash or a near crash incident. However, texting and phone calls are not the only distractions. Others may include eating, drinking, grooming, handling in-vehicle navigation systems, and conversating with passengers.

The FMCSA and the PHMSA have published rules specifically prohibiting interstate truck drivers, bus drivers, and drivers who transport quantities of "placards", which are large amount of hazardous materials, from texting or using hand-held mobile phones while operating their vehicles. The joint rules are the latest actions by the U.S.DOT to end distracted driving. Violations can result in fines and/or driver disqualifications and will impact a motor carrier's and/or driver's Safety Measurement System results.

With new electronic logging device rules, the monitoring of drivers' adherence to the hours of service rules will become more rigorous because computer programs will be tracking the driving and work activity of truck drivers. The California Trucking Association (CTA) has a long history of supporting truck safety initiatives, such as banning radar detectors, prohibiting the use of mobile phones while driving, and administering mandatory drug and alcohol testing. CTA is now calling for several additional safety improvements, such as mandatory use of devices to limit maximum truck speed and a national clearinghouse to track positive drug and alcohol test results and refusals to test.

Commercial Vehicle Enforcement

The CHP provides safety oversight of approximately 8.5 million commercial vehicles. Currently, there are 54 commercial vehicle enforcement facilities (CVEF) located throughout the State. The CHP has jurisdictional authority over the CVEFs and maintains responsibility for commercial enforcement.

CHP mobile road enforcement units are used within their eight divisions throughout California's highways and county roadways (county roadways are often not necessarily seen as commercially traveled routes). The CHP conducts over 500,000 inspections annually in accordance with the California Vehicle Safety Alliance standards set forth in the North American Standard Out-of-Service Criteria. The CHP also provides off-highway enforcement utilizing the Motor Carrier Safety Unit, which includes over 300 non-uniformed motor carrier specialists assigned to one of the eight state field divisions.

The CHP and Caltrans are the State agencies designated by the Governor's Office as the certifying officials for size and weight regulations and enforcement. The CHP is the primary agency responsible for the enforcement of size and weight statutes and regulations, pursuant to the California Vehicle Code (CVC) and Title 13, California Code of Regulations.

Truck Weight Limits

California follows federal law by placing weight limits on trucks to protect pavement and bridges from damage and excessive wear and tear. Truck weight is also a major factor in the severity of truck-passenger vehicle incidents. Heavier trucks and trucks carrying loads exceeding maximum weight limits can be more difficult for the driver to control because they require increased stopping distance, have an increased potential to roll due to a higher center of gravity, generate higher speeds when traveling downhill, and have decreased steering capability, especially at higher speeds.

Table I.1 shows a summary of the CVC weight limits. (Note: The information in this table is paraphrased for brevity. Refer to CVC Weight Sections 35550 – 35558 for more detailed information.)[4]

Table I.1. California Vehicle Code (CVC) Related to Vehicle Weight

Unit	Maximum Weight
Vehicle Combination Gross Weight	80,000 pounds
Single Axle	20,000 pounds
Axle Group: less than 8'-6" (8-feet-6-inches) between outer axles	34,000 pounds
Axle Group: 8'-6" (8-feet-6-inches) or more between outer axles	Varies by distance between axle groups
Source: California Vehicle Code Weight Sections 35550 – 35558	

Caltrans often receives requests to increase truck (or axle) weight limits, or to implement programs that would collect additional fees for compensation of overweight loads. There are several reasons for these requests. Hauling larger loads with fewer trucks can help industries reduce transportation costs and increase efficiency. Competition and changing market conditions puts pressure on freight-dependent industries to lower costs in an effort to provide greater efficiencies and increases in service quality. Transportation costs and flexibility for load size can have a significant effect on economic sustainability, particularly for heavy bulk commodities and highly priced sensitive goods, such as agriculture, lumber and timber, and construction materials. It is paramount to the economic vitality of California that it maintains an efficient freight transportation system and support freight-dependent industries. It is also vital that decision makers and the public understand the trade-offs between economic benefits with increased infrastructure and safety costs that occur when increasing load limits.

To support cleaner truck technologies California passed AB 2061 in 2018. To the extent expressly authorized by federal law, the bill authorized a near-zero-emission vehicle or a zero-emission vehicle, as defined in subdivisions (c) and (d) of Section 44258 of the Health and Safety Code, to exceed the weight limits on the power unit by up to 2,000 pounds[5].

Truck Parking

The demand for commercial vehicle parking far exceeds the supplied capacity in California. When originally conceived, public rest areas were meant to be temporary rest areas for short-term safety breaks for the traveling public. As the trucking industry expanded, these rest areas began to serve as long-term, overnight parking for long-haul commercial vehicle operators, thereby contributing to overcrowding. The lack of availability for truck parking is not just an issue for truck drivers who struggle to secure parking but also for neighborhoods adjacent to freight facilities such as ports, intermodal facilities, warehouse and distribution centers, and manufacturing. These neighborhood streets, empty lots, and business parking lots are used as truck parking when highway rest areas are full or closed. Besides creating safety hazards, neighborhoods frequently must contend with noise, smell, vibration, degradation of air quality, loss of viewshed, and disruption to community cohesion.

Because of the limits on stays in public facilities, parking space shortages, and HOS regulations, truck drivers have few alternatives. Parking underneath overpasses, on roadway access ramps or roadway shoulders are typically unauthorized and pose safety risks for the driver and other users of the highway or road. Accelerating quickly enough to merge into the traffic stream from a parked position on the side of the road is particularly challenging for truck drivers. Additionally, errant vehicles may stray into these areas and strike parked commercial vehicles. Privately owned truck stops are also not plentiful and are frequently filled to capacity, therefor, they are not always available to provide long-term parking. A lack of facilities can influence which route is taken based on the availability of amenities, whether the trip is a long or short haul, the time of day, and the need for staging areas. Just-in-time delivery scheduling and "rolling warehouse logistics" put even greater demand on drivers and on truck parking facilities.

Drug and Alcohol Prevention

The CHP continues to work closely with the trucking industry to educate and reduce impaired driving and to maintain the highest level of compliance. The goal of the program is to ensure all motor carriers located in the state are inspected for continued compliance with state and federal drug and alcohol testing requirements. These inspections are necessary in the continued efforts to reduce the number of impaired drivers on the road.

Air Freight

Freight Security

As with its passenger counterpart, the airline freight industry is pressured to comply with stringent security requirements. As part of the 9/11 Commission Act of 2007, Congress requires all cargo transported in the holds of passenger airplanes originating in the U.S. to be screened at a level commensurate with passenger luggage. Since 2010, TSA regulations mandates the screening of all cargo before it is to be loaded and carried by air both within the U.S. and

internationally. The deadline to meet this mandate was August 3, 2010 and TSA is charged with enforcing it thereafter.

As a solution to bottlenecks experienced at airports, which further impacts the global supply chain due to the complex screening processes for both passenger and cargo packages, TSA devised the Certified Cargo Screening Program (CCSP).[6] Under the CCSP, shippers, freight forwarders, logistics services providers, indirect air carriers, independent cargo screening firms, and air carriers can screen cargo via a secure chain of custody and pass it along where it can go directly onto the aircraft without undergoing additional screening. This approach effectively creates a distributed screening network, allowing screening to be performed at the most cost-effective point in the supply chain and mitigating the impact on system performance, thereby expediting the flow of commerce. The CCSP is a flexible, voluntary program specifically designed to allow shippers with unique requirements to find the approach that best meets their needs. The CCSP requires airlines, freight forwarders, and shippers to assume the costs of these security measures and to establish a secure air freight transport chain.

NextGen

The Next Generation Air Transportation System (NextGen) modernization of the U.S. air traffic system is due for implementation across the country in stages between 2007 and 2025. NextGen aims to transform America's air traffic control system from a ground-based system to a satellite-based system. Global Positioning System (GPS) technology will be used to shorten routes, save time and fuel, reduce traffic delays, increase capacity, and permit controllers to monitor and manage aircraft with greater safety margins. Planes will be able to fly closer together, take more direct routes, and avoid delays caused by airport "stacking" as planes wait for an open runway.

The FAA is undertaking a wide-ranging transformation of the entire U.S. air transportation system through the NextGen program, which is developed to reduce gridlock both in the sky and at the airports. In 2017, FAA published an Implementation Plan Update, including a summary of accomplishments and the NextGen priorities annual plan through 2019. The NextGen Integration Working Groups successfully completed 52 commitments in fiscal year 2017, advancing operational improvements to the National Airspace System (NAS) in all areas. In February 2017, the NAC chairman proposed that the NAC focus on implementing NextGen in the Northeast Corridor, recognizing that making continuous improvements to the system in the Northeast Corridor operationally benefits the entire U.S. aviation system. Although this national effort focuses more on flight improvement across NAS, operational improvements provide benefits to the air cargo industry as well.

Maritime Freight

The maritime industry has always placed a high priority on security. Terrorism, weapons and drug smuggling, customs duty evasion, and piracy have been among the chief safety concerns. The international dimensions of the shipping industry, the large number of maritime ports, the vast fleet of global shipping, the range of products carried in vessels, and the difficulty of

detection has made the issue of security in shipping a persistent concern. For ports, vulnerabilities can range in levels of exploitation and severity from both land and water. Recently, more scrutiny from customs officials has focused on identifying illicit and/or dangerous cargoes within containers. All containers imported to U.S. seaports are scanned through radiation portal monitors (RPM) prior to leaving a marine terminal on trucks or rail cars. Other selected containers are also scanned or manually inspected by U.S. Customs and Border Protection (CBP) based on their assessment of risk or by random selection. The United States Coast Guard (USCG) inspects cargos and containers for compliance with the Federal Hazardous Materials Transportation Law (FHMTL) and the International Safe Container Act of 1977 (ISCA) (46 U.S.C. §80501-80509). Regulations implementing the FHMTL are codified in 49 C.F.R. §107-180. Regulations implementing the ISCA can be found in 49 C.F.R. §450-453. The Coast Guard inspects containers of general cargo to ensure hazardous materials are being shipped legally. Undeclared hazardous material shipments are a leading cause of transportation incidents.

The USCG also has responsibility for the Transportation Worker Identification Credential (TWIC) program. The TWIC program was developed following the legislative provision of the Maritime Transportation Security Act (2002, 2010) and the Security and Accountability for Every Port Act of 2006. The TWIC identification card is a tamper-resistant credential that contains biometric information about the holder, rendering the card useless to anyone other than the rightful owner.

Vessel Safety and Security

The Maritime Transportation Security Act of 2002 (P.L. 107-295) was designed to protect the nation's ports and waterways from terrorist attacks. The basic elements of this legislation were adopted by the International Maritime Organization (IMO) in 2002 as the International Ship and Port Security code (ISPS). There are three important features of these interventions. First is the requirement for an Automated Identity System (AIS) to be fitted on all vessels from 300 gross tonnage and upward. The AIS requires vessels to have a permanently marked and visible identity number, and there must be a record maintained of its flag, port of registry, and address of the registered owner. Second, each port must undertake a security assessment of its assets and facilities, quantifying the effects of damages caused. The port must then evaluate the risks to its physical security, communication systems, and utilities. Lastly, all cargoes destined for the U.S. must receive customs clearance prior to the departure of the ship. It is proposed that biometric identification for seafarers are implemented and that a national database of sailors be maintained.

The ISPS code is being implemented in ports around the world. Without certification, a foreign port would have difficulty in trading with the U.S. Thus, it is becoming a factor in a port's competitiveness. The need to comply with ISPS has become an urgent issue in ports of various cargo volumes around the world. The costs of securing sites, undertaking risk assessments, and monitoring ships all represent an additional cost of doing business without any commercial return. U.S. ports have been able to tap funding from the Department of Homeland Security, but foreign ports must comply or else risk the loss of business. In 2008, legislation in the U.S.

required that all containers being shipped to the U.S. undergo screening. Foreign ports will be expected to purchase gamma-ray and x-ray scanners, and undertake screening of all U.S.-bound containers, regardless of the degree of the security threat. This is a further financial and operational cost for foreign ports to comply with. Security has become an additional element in determining competitive advantage.

Land Ports of Entry Freight

Border Safety and Security

California and Mexico share over 130 miles of international border. The border is a vital economic gateway for international trade and a key contributor to the economic well-being of both countries. Under the auspices of the Department of Homeland Security, the U.S. Customs and Border Protection (CBP) safeguards the U.S. - Mexico Border. Its top priority is "keeping terrorists and their weapons out of the U.S. while facilitating lawful international travel and trade." Regarding to freight, the CBP's primary responsibility is to "safeguard America's borders thereby protecting the public from dangerous people and materials while enhancing the Nation's global economic competitiveness by enabling legitimate trade and travel."

The CBP creates and implements programs using sophisticated technologies, and trains personnel to help achieve the goals of securing U.S. ports and borders while supporting and expediting trade. Initiated after 9/11, the Free and Secure Trade (FAST) Program is a commercial clearance program for known low-risk shipments entering the U.S. from Mexico and Canada. FAST allows for expedited processing for commercial carriers who have completed background checks and certain eligibility requirements.

C-TPAT is a voluntary government and business initiative intended to build cooperative relationships that strengthen and improve the overall international supply chain and U.S. border security. Nationwide, there are over 78,000 commercial drivers enrolled in the program and 10,000 companies worldwide are certified under C-TPAT. FAST membership is $50 U.S. or Canadian currency and covers five years. One of the key benefits of enrollment for carriers is access to dedicated lanes in transborder shipments which allow for greater processing speed and overall efficiency. For the U.S., Mexico, and Canada, the program helps to support supply chain security while promoting economic prosperity.

In 2016, the U.S. CPB announced the full implementation of Automated Commercial Environment (ACE). As the platform that enables the United States' Single Window, ACE provides a single, centralized access point for the trade community to connect with CBP and its Partner Government Agencies. ACE is the system of record by which electronic trade transactions are conducted and recorded by CBP. ACE has streamlined collection and improved enforcement. With the ACE cargo processing system, trade transactions are more efficient, standardized, simplified, less costly, and more predictable for importers and exporters.

CBP has also been working to design a government-wide 'trusted trader' partnership program that would integrate CBP's C-TPAT and the Importer Self-Assessment with other U.S. government trusted trader programs. In July 2016, CBP published the draft "Trusted Trader

Strategy Framework" whose objective is to co-create a strategy in terms and practice, one which acknowledges the significant commitment of partnership between the U.S. government and trade, in global trade and security. The Trusted Trader framework begins with a foundation of security and continues through current certified membership in C-TPAT baseline of engagement. This Trusted Trader pilot program was announced on June 16, 2014 in Federal Register 79FN13992 and transforms the existing Importer Self-Assessment program into the new Trade Compliance Program, which provides importers and exporters a platform to achieve an integrated partnership for security and compliance. The pilot program has since been continued and expanded. In January 2018, CBP, the Trusted Trader Subcommittee members, and the Trusted Trader Pilot participants met in Long Beach, California.

Freight Transportation Resiliency

"Freight resiliency" is the ability for the freight system to quickly detect, absorb, and recover from disruptions and return to normal operating levels. These disruptions can range in severity and scale, and from small-scale events with a localized impact (such as a power outage at a distribution center), to large events with far-reaching effects (such as earthquakes, mudslides, or terrorist attacks). The ability of a system to rebound depends on many factors, including: the structure of the specific freight system (manufacturing, shipping, processing, delivery), personnel training, transportation redundancies (such as having multiple options, modes, or routes), and public and private actions taken to preserve or restore service in case of a disaster or disruption.

Resilience in the state's freight system is needed for California to meet its growing needs for efficient freight mobility, as well as to help meet challenges presented by California's changing climate. Without resiliency, infrastructure will be subjected to faster deterioration due to extreme weather events. The public will be faced with increases in system disruptions, and private enterprises may lose competitiveness. The 2018 update to California's Fourth Climate Change Assessment has shown a dramatic shift in California's climate future that will affect people, the natural landscape, and infrastructure.[7] **Table I.2** shows the key findings from the Fourth Climate Change Assessment for statewide climate trends that are expected to occur between 2050 and 2100. Effects on freight are added to this summary table to illustrate potential outcomes because of these changing climate conditions.

Table I.2. Key Findings Adapted from California's Fourth Climate Change Assessment to Include Potential Impacts to Freight Systems

Climate Stressor	Future Change	Impacts to Freight
Temperature	**By 2100**: 5.6°-8.8° increase in daily temperature	Increase in daily temperatures can lead to hotter warehouses and damage to truck tires and engines. Workers will need more protections from overheating (e.g., access to air conditioning, more frequent breaks, and shorter shifts).
Water	**By 2050**: Water supply from snowpack is projected to decline by two-thirds	Agricultural shortages could arise from the limited water supply, which would change patterns of freight from California's Central Valley to more reliance on food imports from other countries.
Wildfire	**By 2100**: Average land area burnt will increase by 77%	Road closures from damaged highways could results in freight trucks needing to be rerouted to other highways that may be further away, thus increasing delivery and shipping costs and times.
Sea Level Rise	**By 2100**: • 31%-67% of Southern California beaches may completely erode • $17.69 billion worth of residential and commercial buildings could be inundated statewide • The number of highway miles exposed to coastal flooding will triple	Inundation could cause relocation of container yards, commercial buildings, and warehousing, especially those found in coastal areas that have not Implemented adaptation measures. Flooding of highways will lead to road closures which could affect the trucking industry.
Source: California's Fourth Climate Change Assessment		

The projected changes in California's climate highlight the need for transportation systems to be resilient and quickly regain "business as usual" operations despite changing circumstances. System disruptions are almost impossible to predict with accuracy because they can stem from many sources and have many different types of impacts. This highlights the need for the freight system to be flexible and be able to swiftly recover from shocks. **Table I.3** shows disruption events and possible corresponding freight impacts to illustrate unpredictability the freight system faces.

The wildfires that now occur nearly year-round in California are recent examples highlighting the need for resiliency. From 2017 to 2019, California experienced some of the most devastating fires in its history, whether in terms of acres burned, structures destroyed, or lives lost. These fire events interrupted freight rail and roadway mobility and closed freight-related businesses. The interruptions, though necessary to save lives and speed up emergency crew movements, impede freight movements and shipments of goods, both perishable and shelf-stable. The rate of natural disasters is predicted to increase due to California's changing climate.

Table I.3. Event Types and Possible System Failures

Disruption Source	Event Type	Possible System Failures
Climate Change	Wildfires	• Downed powerlines • Road closures • Damage to infrastructure
	Increased Tornado/Hurricane Strength	• Downed powerlines • Damaged or destroyed buildings • Inaccessible roads
	Sea Level Rise/Storm Surge	• Flooding • Salt water intrusion and corrosion of electronic systems • Damage to rail, highway, seaport, airport infrastructure
	Intense Precipitation	• Flooding • Low visibility • Washout of roads and rail substrates
	High Winds	• Downed power lines • Vehicles blown off roadways or overturned • Increased threats to bridges • Delays to air freight flights
	Increased Temperatures	• Vehicles overheating • Tire blowouts • Rail track expansion and buckling • Thermal expansion of bridge joints
	Cliff Retreat	• Unstable roadways • Inaccessible roads • Loss of connectivity between cities
Geophysical	Tsunamis	• Flooding • Saltwater intrusion and corrosion
	Earthquakes and surface rupture	• Uneven pavements • Downed powerlines and communications
	Sinkholes	• Unstable roadways

	Landslides (mass movement)	• Inaccessible roads • Debris clogging tunnel passages
	Volcanic Eruptions	• Inaccessible roads
Human Activity	Accidents	• Traffic congestion • Closed roads
	Communications Failures	• GPS failures • Telephone failures
	Cyber Attacks	• Disrupted distribution operations
	Terrorism	• Destroyed infrastructure • Closed roads
	Economic Collapse	• Disrupted freight operations
	Protests/Boycotts	• Disrupted freight operations • Inaccessible distribution centers • Closed roads • Goods unable to be sold
Source: California's Fourth Climate Change Assessment		

The rapid development of e-commerce, economic globalization, just-in-time production, and logistics and supply chain systems over the past decades have led to a significant need for efficient and effective management of freight movements. Businesses and consumers have become increasingly dependent on the freight transport system to deliver their goods on time, because increasingly, far less inventory is stored in regional warehouses and stores. Freight movement in the U.S. has increased dramatically over the past 20 years. Highway vehicle miles traveled grew by approximately 98 percent; however, the highway network expanded less than 5 percent between 1980 and 2007. Significantly more freight is being moved on the same relative number of lane miles, which results in increased delays from higher traffic volumes and more maintenance needs on the road network.

Disruptive, weather-related events have increased dramatically over time. Individuals, businesses, industries, and public sector government agencies are not immune to sudden events that disrupt normal daily activities. Trucking companies, rail carriers, infrastructure managers, and terminal and port operators must invest to prevent or mitigate the effects of disasters. Whether attributable to acts of nature, human error, mechanical failure, or intentional disruptions, identification of future threats and plans for the ability to quickly respond to them is needed.

Due to increased goods movement activity, it is imperative for the freight system to be equipped to handle climate, environmental, human, and geophysical events. While it is difficult to predict when an event may occur, it is important for the system, as well as both the public and private sectors, to be prepared for its eventuality. Failure to adapt can be disastrous to individuals, businesses, governments, and the economy.

Importance of Resiliency in Freight

Effects to a Non-Resilient System

The impacts to a freight system unprepared for climate resiliency have far-reaching consequences outside of private industry profit margins. Disruptions in freight movements can mean freight industry workers are unable to reach their jobs, thus experiencing a loss in wages. Agricultural crops can decline in quality or even spoil if trucks are delayed between farms and distribution points. Delays in shipping products to consumers could have disastrous consequences, such as diabetic patients not receiving their insulin shipments on time, or that stores not stocked with goods necessary for helping residents weather a severe storm event.

Local, regional, state, and federal governments can be severely affected fiscally if the freight system is not adequately prepared for a major climate, human, or geophysical event. Ignoring the need for repairs, retrofitting, or adaptation measures could accelerate the failure of vital infrastructure, thereby substantially increasing the costs to repair after an event more than proactively maintaining it.

Benefits of a Resilient System

A freight system that has been successfully adapted to the upcoming climate changes will be better suited to quickly recover from disaster events, thus saving time, money, and lives. Private industries and public agencies can ensure a resilient system by adapting infrastructure to withstand greater shifts in climate.

Public incentives are available to private businesses, such as rebates for installing solar infrastructure, which helps the state more quickly adopt climate adaptation measures, thus increasing California's resilience to energy demands. Solar infrastructure can safeguard a business to ensure refrigeration systems can still run, even in power outages, which will prevent inventory from spoiling. Other public measures, such as increasing funding for elevating bridges over bodies of water to accommodate increases in precipitation or sea level rise, identifying areas prone to rockslides or mudslides and fortifying the area to protect the roadways and traveling public, or by communicating road closures and openings quickly so that truckers and delivery trucks can get back on their regular routes are examples of ways California can increase resiliency for the freight system.

Accommodating disruptions within the freight transportation system often needs a variety of measures. Reliable freight transportation is a prerequisite for an efficient supply chain. As ground transportation systems have become more congested and less able to accommodate shifting demands, improving resilience of the transportation system itself becomes a priority.

Two important points should be taken from this section:

- Public-private relationships are integral to building and supporting a resilient system.
- Communication is critical to saving lives in case of a catastrophe.

Current Efforts

Private Sector

The Burlington Northern Santa Fe (BNSF) rail line publicly releases its yearly "Corporate Responsibility and Sustainability Report," which outlines the continuing efforts to," enhance safety, including efforts to reduce energy consumption and carbon emissions with more sustainable operations."[8] As a rail operator that carries more than 40 percent of America's freight and as North America's second largest freight railroad network operating over 32,500 miles of track, BNSF has been striving to ensure its operations are resilient. The largest concern for BNSF is the event of a hazardous waste spill. The company operates under "Common Carriage" responsibilities, meaning that it is required to make reasonable accommodations for the transportation of any hazardous material or commodity. In 2017, BNSF carried over 1.3 million customer hazmat shipments across its network. To reduce the risk of accidents, BNSF uses," wayside detectors, track inspections, reduced speeds, positive train control, and stronger tank cars." Crude oil and ethanol are among the hazardous materials BNSF transports, and BNSF requires that trains travel no faster than 50 miles per hour (mph), with speeds under 35 mph in areas with 100,000 or greater inhabitants.

Union Pacific Railroad (UPRR), the largest railroad operator in the U.S. after BNSF, is also concerned with the human element of potential disruptions. A 2016 report published by UPRR, the "2016 Building America Report - A Report to Communities on Our Social, Environmental, and Economic Sustainability Progress," addresses a variety of concerns the company faces during its day-to-day operations, such as environmental health, employee and customer safety, and resource management. UPRR, similar to BNSF, is also highly concerned with hazardous material transportation safety. The UPRR report stresses emergency response trainings for first responders, UPRR employees, and volunteers.

By offering paid employee training on safety procedures while transporting hazardous materials, BNSF and UPRR set an example of how private responsibility is taking the lead to benefit public well-being. Employee, volunteer, and first responder training directly increases resiliency in an emergency, because well-organized and orchestrated disaster relief actions can improve responds to events and improve situation assessments. Also, the practice of using new technology, stronger equipment, and reductions in train speeds reduces the vulnerability of the freight system from accidents that can contribute to spills, destruction of property, injuries, or deaths.

Public Sector

Caltrans has concluded statewide vulnerability assessments to learn the extent to which the SHS will be affected by a changing climate by horizon years 2025, 2055, and 2085. These vulnerability assessments explore how rising temperatures, sea level rise, storm surge, and rates of wildfire may impact the SHS. The outcomes of these vulnerability assessments will lead each of the 12 Caltrans districts to develop their own Climate Adaptation Strategy. These strategies are intended to guide decisions to address the vulnerable areas of highways, with the aim to develop design changes to help protect users from potential hazards.

Caltrans has administered the Climate Adaptation Planning Grants for three fiscal years (2017-2020). These grants, totaling $20 million, are funded through SB 1, a transportation funding bill passed by the California legislature and backed by voters in 2018. Adaptation Planning Grants aim to advance climate planning on California's transportation infrastructure, including roads, railways (public railways that both private and public rail lines use), bikeways, trails, transit lines, bridges, bus terminals, seaports, and airports.

The Climate Adaptation Grants awarded to regional and local governments within California are helping communities plan for improvements to their transportation infrastructure in the face of increased extreme heat events, precipitation, drought, storm surges, sea level rise, and wildfires due to climate change. To date, over 40 planning grants have been awarded, empowering communities throughout California to safeguard their transportation systems against disruptions caused by a changing climate. Findings from these plans aid local, regional, and state efforts of increasing climate and system resiliency while decreasing vulnerabilities regardless of source type. These efforts ensure that the freight system (and by extension California's economy), environment, and residents are resilient to any disasters that may disrupt normal life.

Endnotes

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Appendix J. Smart Growth and Urban Freight Considerations

Recent and impending technological advancements stand to revolutionize urban transportation. From autonomous vehicles and intelligent transportation systems to shared- and micro-mobility (i.e., electric scooters, bikeshare), many facets of urban transportation are evolving, and urban goods movement is no exception. The rapid increase of e-commerce as a share of global retail sales has reduced the number of trips that households must make to buy goods, but this reduction in trips has been offset in many metropolitan areas by increases in package delivery trips.[1] The wide availability of many commonly demanded products through online retailers like Amazon resulted in large increases in rapid direct-to-consumer package deliveries. Online retailers like Amazon can deliver many products the same day they are ordered by consumers.[2] The resulting increase in delivery trips has increased competition for limited curb space in many metropolitan areas, as goods movers must share the curb with Transportation Network Companies (TNCs), transit vehicles, parked automobiles, bicyclists, and pedestrians.[3]

As the global transportation and goods movement industries evolved over time, cities rapidly grew and are expected to continue this trend in the future. According to the World Bank, 55 percent of the global population lives in urban areas today; by 2050, 68 percent of the global population will be urban.[4] In California, 95 percent of the population lived in urban areas in 2010, compared to 94 percent in 2000.[5] As the world becomes more urbanized, the demand for commercial activity will continue to increase as people consume more goods and services than ever before, driving up competition for both space and resources.[6]

From an urban planning perspective, the growth of cities has resulted in many negative consequences, including increases in GHGs from automobile use and industrial activity, and sprawling development patterns that consume large quantities of land. This has led to the adoption of 'smart growth' as a planning philosophy, which aims to promote "compact development (moderate to modestly high density), a mixture of land uses in that development, and a range of feasible transportation options that promote and facilitate the use of modes of travel other than the automobile (e.g., transit, bicycles, and walking)".[7]

While the achievement of smart growth goals may ultimately serve to make cities more livable for people, it also presents challenges to the urban goods movement industry, which has historically been overlooked in metropolitan planning processes. While the achievement of smart growth goals will undoubtedly supply many benefits to urban populations, urban planners and local governments must be mindful of the needs of the goods movement industry and urban consumers and businesses, which are all central to the urban economy.

Smart Growth

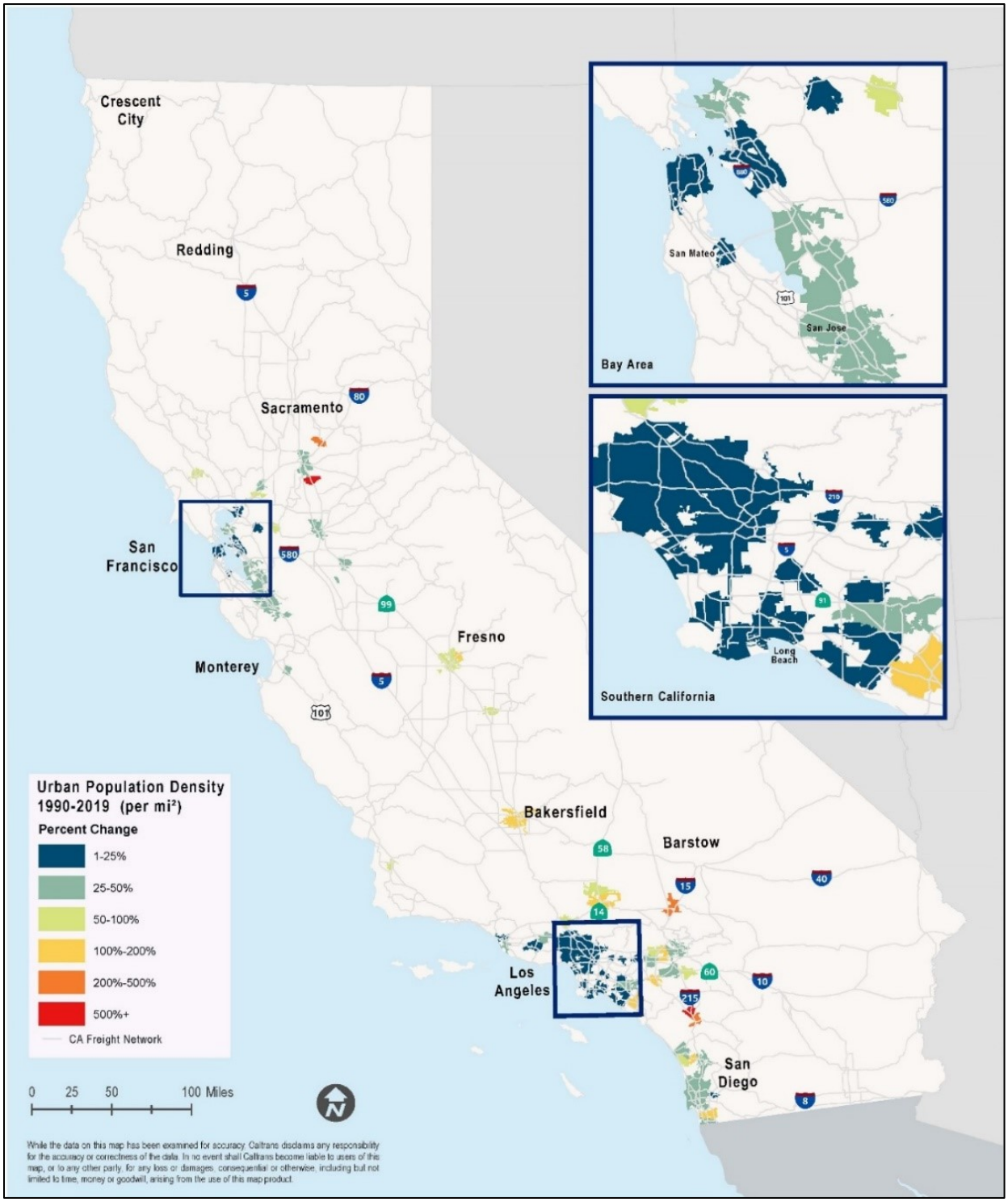
Urban areas in the United States have historically been automobile-centric environments, and the urban planning profession has contributed to this through the development of such policies as minimum parking requirements, minimum lot sizes, and restrictions on development density. [8] Automobile dominance in the United States has been intensified since the 1950s by the interstate highway network, which served to improve connectivity within and between urban areas, making extensive automobile travel both possible and attractive. However, population density has been increasing in most California cities over the past thirty years as an increasing share of the state's population is choosing to live in urban areas, which is increasing competition for road infrastructure, as the urban goods movement industry must share the road with an increasing number of personal automobile users.

Figure J.1 shows a map of the percent change in urban population density from 1990-2019 (in people per square mile) for California cities with a population of 100,000 or more; 35% of those cities experienced an increase in population density of 1-25%, and 31% experienced an increase of 25-50%. Three cities experienced an increase in population density of 200-500%, and two cities experienced an increase greater than 500%, suggesting that little or no development existed in those areas prior to 1990. The areas with the largest increases in population density are in the Sacramento area and in Southern California between Riverside and Carlsbad.

Expansion of the roadway infrastructure in urban areas has facilitated economic growth, including within the freight industry; however, the widespread adoption of automobile-oriented urban development results in many negative consequences, including increased GHGs and associated reductions in air quality due to automobile dependence, increased quantities of impervious surfaces and associated degradation of water quality due to polluted runoff, and loss of open space due to increased land consumption, to name a few.[9]

As awareness of the impacts of automobile dependency has grown, urban planners and policy makers have increasingly looked to policies under the umbrella of 'smart growth' to enhance the livability of cities and curtail the negative impacts of automobile dependency. [10] In California, several pieces of legislation (AB 32, SB 375, SB 743, SB 50) have been passed or proposed to advance smart growth priorities. SB 375 requires CARB to set regional targets for GHG reductions and requires metropolitan planning organizations to include a 'Sustainable Communities Strategy' detailing how those reductions will be achieved.[11] Once fully implemented, SB 743 will change the way transportation impact analysis is conducted in California, shifting the focus from measuring traffic congestion to measuring the impacts of driving using key metrics such as VMT per capita, VMT per employee, and net VMT, which will disincentivize driving.[12] SB 50 seeks to incentivize residential development projects that provide high job accessibility or transit accessibility, both of which would reduce the need for vehicle trips.[13]

Figure J.1. California Urban Population Density Change in Major Cities, 1990 – 2019



Source: Map created by Fehr & Peers, Data from U.S. Census Bureau, 1990- 2019

Historical urban development patterns in the United States have often been characterized as 'sprawling,' which is indicative of an increase in per capita land consumption and an increase in the distance between trip origins and destinations, both of which drive up the cost of providing urban services.[14] In contrast to sprawling development patterns, smart growth policies "result in more compact, multimodal development, reduce per capita land consumption and the distances between common destinations, which reduces the costs of providing public infrastructure and services, and improves accessibility and reduces per capita motor vehicle travel, which in turn provides economic, social and environmental benefits".[15] In its 2006 report, This Is Smart Growth, the U.S. EPA identified ten fundamental principles of smart growth to guide metropolitan planning and development decisions.

U.S. EPA Smart Growth Principles

1. Mix land uses
2. Take advantage of compact building design
3. Create a range of housing opportunities and choices
4. Create walkable neighborhoods
5. Foster distinctive, attractive communities with a strong sense of place
6. Preserve open space, farmland, natural beauty, and critical environmental areas
7. Strengthen and direct development towards existing communities
8. Provide a variety of transportation choices
9. Make development decisions predictable, fair, and cost effective
10. Encourage community and stakeholder collaboration in development decisions

Source: This Is Smart Growth (US EPA 2006)[16]

Implementation of the Smart Growth principles impacts planning and development decisions by increasing urban building density and reducing car dependency by mixing residential, retail, office, and light manufacturing land uses, reducing street widths, and supplying a wide range of destination types within walking or bicycling distance of residential locations across the socioeconomic spectrum. Although this has far-reaching benefits for livability and quality of life in urban areas, several of the Smart Growth principles present challenges for the urban goods movement industry.

Several studies have attempted to quantify the benefits of smart growth compared to the costs of sprawl. Ewing and Hamidi created an index to measure urban compactness.[17] The index was constructed using data from the Census and the U.S. Geological Survey's National Land Cover Database and involved principal component analysis of six weighted factors: gross population density in persons per square mile; the percentage of the county population living at low suburban densities of 100 to 150 persons per square mile, corresponding to less than one housing unit per acre; the percentage of the county population living at medium to high urban densities of more than 12,500 persons per square mile, corresponding to roughly eight housing units per acre; the net population density of urban places within a county; the average block size; and the percentage of blocks with areas less than 1/100 square miles, corresponding to the average size of an urban block. The authors found that nationally, a 10 percent increase in an urban area's compactness score was associated with a 0.6 percent decline in average

household vehicle ownership and a 7.8 – 9.5 percent decline in VMT, while walking commute mode share increased by 3.9 percent and public transit commute mode share increased by 11.5 percent.[18,19] The San Francisco-Oakland, Oxnard, and Los Angeles-Long Beach-Anaheim urbanized areas ranked among the top ten most compact urbanized areas in the nation according to the study.

In a meta review of 300 academic papers studying the impacts of compact urban forms, Ahlfeldt and Pietrostefani (2017) found that 69 percent of the studies reviewed uncovered positive effects associated with increases in compactness, including higher wages, increases in local public spending, pollution and energy use reduction, and increases in non-car mode choice, among others.[20] More than 70 percent of the studies reviewed attributed positive impacts to increased economic density, while 56 percent attributed positive impacts to increased built environment density, and 58 percent attributed positive impacts to an increase in the proportion of mixed land uses.

While a large body of literature has examined the benefits of smart growth for personal travel and livability, relatively little work has been done to examine the impacts of smart growth on urban goods movement. The existing body of knowledge concerning the impacts of smart growth on urban goods movement is presented in detail in later in this chapter.

Urban Goods Movement

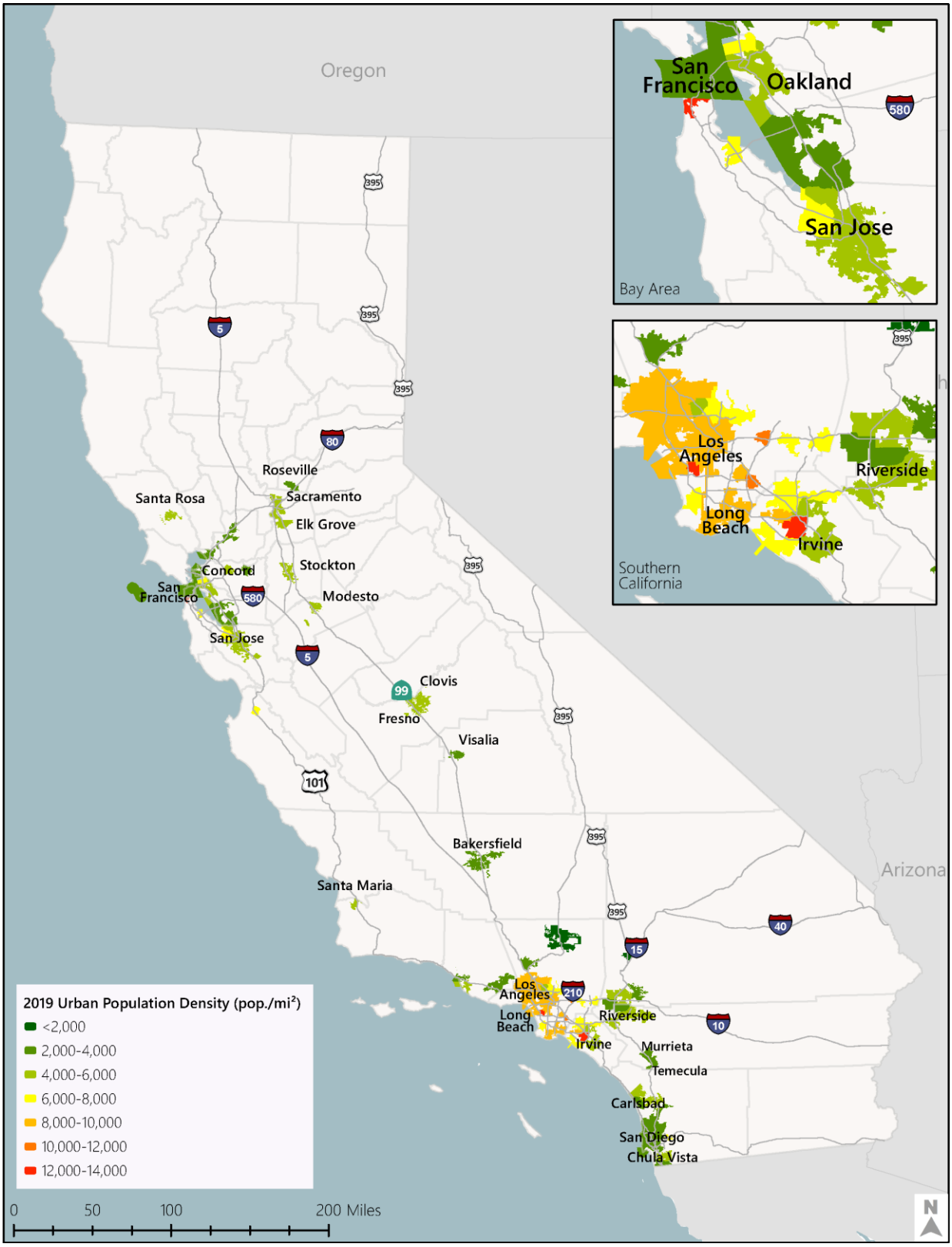
Urban goods movement refers broadly to the movement of products, including package delivery and waste management, throughout urban areas.[21] More specifically it is "the complex network of vehicular modes, technological systems and physical structures controlled by people that are responsible for sending and receiving goods."[22] Given that urban areas are major sources of demand for goods and many freight trips originate or end in an urban area (first mile/last mile), urban goods movement is a major part of the broader freight industry and the economy at large.

Figure J.2 provides a map of urban population density in 2019 for California cities that have a population of 100,000 or more, highlighting the geographic locations throughout the state that support the urban goods movement industry. In California, ninety-five percent of the population lives in urban areas (including outlying suburban areas), and the state's annual gross domestic product (GDP) of more than 2.4 trillion dollars accounts for approximately 14 percent of the nation's GDP; goods production and movement within and between urban areas throughout the state undoubtedly plays a major role in the economic growth of California and the country.[23] Ultimately, goods movement forms the backbone of California's economy, as every California resident and business depends on the prompt delivery of various goods from their place of manufacture to where they are consumed.

Urban goods movement as an industry has undergone rapid change in recent years and is expected to continue at a similar pace as new technologies reach widespread adoption. Within the past decade, e-commerce has exerted a strong influence on urban goods movement, affecting both the quantity and the timing of deliveries. According to market research firm

eMarketer, e-commerce accounted for 7.3% of global retail sales in 2015 and is expected to account for 12.4 percent by 2019.[24] The majority of e-commerce establishments and employees are located in California.[25] Additionally, the top five buying markets in the country in terms of price for industrial commercial real estate are located in California (Los Angeles, San Francisco, Oakland, Sacramento, and San Jose), and this is connected to the increase in demand from big box retailers for fulfillment centers used to ship online orders.[26]

Figure J.2. 2019 California Urban Population Density in Major Cities



Source: Map created by Fehr & Peers, Data from U.S. Census Bureau, 2019

While the shift toward e-commerce has had a large impact on deliveries to private residences, requiring more frequent deliveries and a greater number of delivery vehicles to meet the demand, commercial businesses have also been affected. According to the Volvo Research and Educational Foundations, "Online sales are growing three times faster than traditional retail sales and companies have shifted to just-in-time deliveries – receiving goods only as they are needed to reduce inventory cost – requiring more frequent and customized deliveries."[27] This has become standard practice for many businesses as they look to maximize revenue in the face of increasing urban rents. Shifting to just-in-time deliveries has also increased the frequency of deliveries and the number of delivery vehicles needed.

A burgeoning technology that stands to radically transform the entire transportation industry – including goods movement – is vehicle automation. While substantial investments have been made in vehicle automation for personal transportation, the goods movement industry will be impacted as well. Companies like Tesla have already developed prototype autonomous semi-trucks that may someday be manufactured at scale to meet the needs of the freight industry. [28]

Autonomous vehicles (AVs) are projected to supply several benefits: safety improvements, congestion reduction, and greater fuel efficiency. According to Bucsky (2018), "the associated benefits of AV technologies in goods transport can be categorized into three groups: (1) traffic related gains (lower travel time, shrinking costs, less traffic), (2) economic (financial benefits for transport companies, e.g. lower costs, restructuring of market), (3) safety and environment."[29] Bucsky notes the many potential implications of shifting to AV technology to the goods movement industry, one of which is the displacement of a human driver.

Alternatively, other automation scenarios may be adopted including truck platooning, in which a convoy of several trucks would be operated by a single human driver in the lead truck; highway automation with drone operation, in which a human operator would remotely control trucks on local streets, but allow the truck to operate autonomously on highways; and highway exit-to-exit automation, in which a human driver would navigate a load through local streets and complex driving situations such as congested urban freeways with many on and off ramps and then attach the load to a self-driving truck for long-haul travel on the freeway. [30, 31]

While much research has focused on the potential benefits of AV technology to the transportation industry and the goods movement industry specifically, widespread adoption of the technology may also create significant challenges for goods movement. According to a report by Viscelli (2018), adoption of autonomous trucks for long-haul deliveries will potentially have major implications for employment in the freight industry, threatening nearly 300,000 trucking jobs. Without policy intervention to protect jobs, "the most likely scenario for widespread adoption involves local human drivers bringing trailers from factories or warehouses to 'autonomous truck ports' (ATPs) located on the outskirts of cities next to major interstate exits. Here, they will swap the trailers over to autonomous tractors for long stretches of highway driving. At the other end, the process will happen in reverse: a human driver will pick up the trailer at an ATP and take it to the destination."[32]

This scenario would likely retain most trucking jobs in urban areas, but currently most of the best trucking jobs – those with the highest pay and the best working conditions – are those related to long-distance goods movement. With long distance goods movement being handled by autonomous trucks, 83,000 high quality jobs would be lost along with 211,000 jobs with "moderate wages but high turnover rates and poor working conditions."[33] From the perspective of goods movement firms, reducing the need to employ human labor will ultimately drive up revenues and the shift to AV technology will be a net benefit. As Flamig (2016) notes, "transport itself adds no value to the product. For this reason, applications where transport could take place without a driver were developed for in-house logistics as early as the 1950s."[34] Despite the benefit to firms of reducing labor costs, policy interventions may become necessary to balance the benefits of AV technology with the economic needs of workers in the freight industry.

Smart Growth & Urban Goods Movement

Smart growth goals and urban goods movement priorities often appear to be at odds with one another. From a smart growth perspective, the increase in delivery vehicle trips that has resulted from the growth of e-commerce and just-in-time deliveries stands in stark contrast to the goals of reducing vehicle miles travelled, greenhouse gas emissions, and automobile congestion on urban streets. The mechanics of goods movement is often taken for granted by urban planners, local governments, and consumers alike because goods are expected to be delivered on time and in enough quantities to keep the economy running. However, the process of moving goods where they need to go is often seen as a nuisance.

According to the Guidebook for Understanding Urban Goods Movement (Rhodes et al. 2012), "Cities are quickly becoming the most concentrated, dense consumer market in history. Meanwhile, the capacity of urban transportation infrastructure has increased only modestly. Urban design and regulations affecting how freight moves in modern cities have failed to keep pace with the growing demand for goods and services, and the transportation systems that support modern logistics and supply chain management."[35] Concrete steps must be taken to align smart growth and urban goods movement priorities to ensure that the economic engine of the goods movement industry is able to perform at its peak ability while simultaneously improving the livability of cities and reducing their environmental impacts. Seven key stakeholders will be needed to make this happen[36]:

- government (including transportation planning agencies),
- communities and residents,
- shippers,
- truckers,
- distribution and warehouse facilities,
- property owners and managers, real estate developers,
- commercial establishments

Policy and Infrastructure Impacts

Delivery trucks contribute to and are affected by congestion in metropolitan areas. This creates significant economic inefficiencies for the urban goods movement industry while also hindering the achievement of smart growth goals by worsening congestion and causing increases in greenhouse gas emissions. According to the report, Urban Freight for Livable Cities, urban goods movement – which constitutes the 'last mile' of the logistics chain – accounts for more than a quarter of the total cost of freight transport.[37] The Texas A&M Transportation Institute states that trucks generate 17 percent of the cost of congestion in the United States but represent only 7 percent of all traffic.[38]

Because urban roads are narrower than freeways and serve more user types, deliveries within cities typically cannot be made using full-size trucks. Instead, deliveries are made by trucks that are approximately one-third of the size of a full-size truck, which necessitates the use of more delivery vehicles and increases inefficiency in the logistics chain--including additional miles travelled and land use compatibility issues associated with freight transfers from line haul to local trucks. Compounding the problem, many trucks on urban roadway networks are only partially loaded or may be empty. According to the Volvo Research and Educational Foundations, "in the U.S. trucks generate 20 billion miles each year while driving empty".[39] Implementation of Principles 2 and 4 of the US EPA Smart Growth principles could present direct challenges for truck movement in urban areas since it may result in the narrowing of urban streets. Considering this, planners and policy makers should consider the turning radius requirements at intersections of urban freight delivery vehicles when evaluating projects that narrow streets by adding pedestrian and bicycle safety infrastructure and amenities. In some cases, alternative goods movement routes can be chosen to ensure that delivery vehicles can access the destinations they need to access, while still improving walkability and compactness in strategically chosen locations.

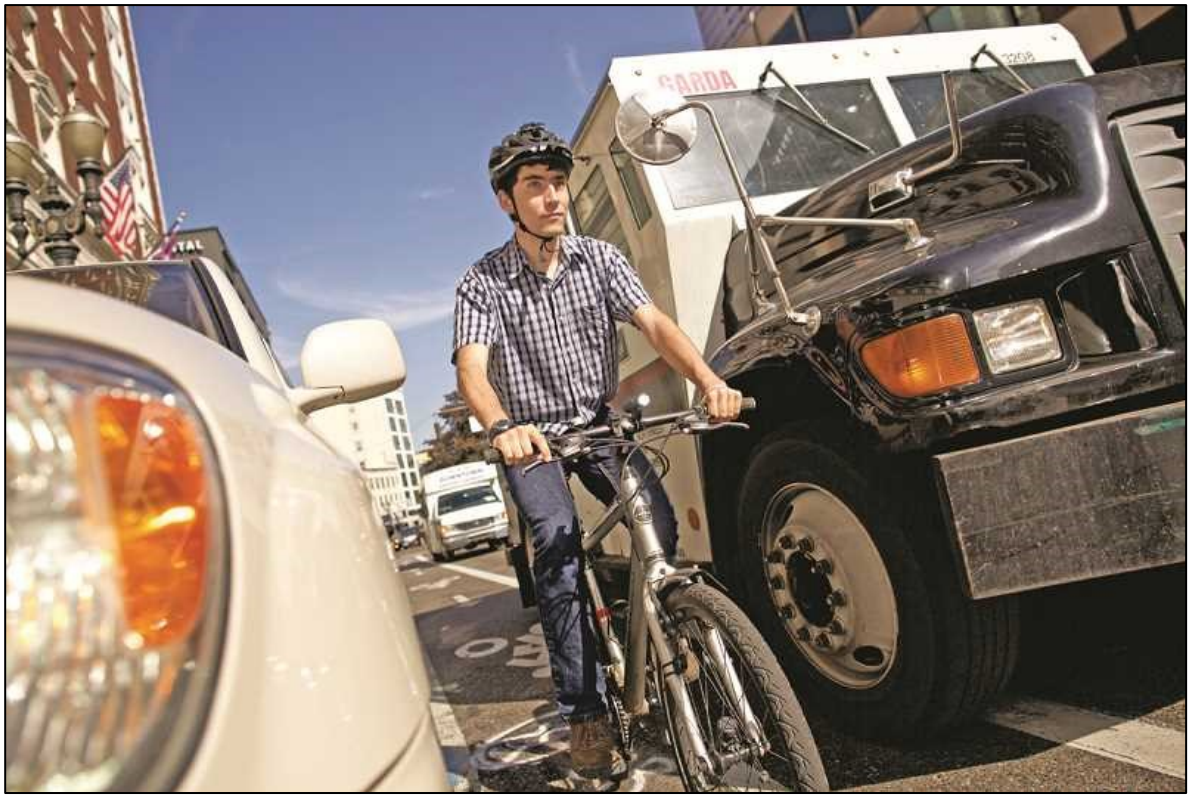
Many urban road narrowing projects are undertaken to provide 'complete streets' that serve all users instead of focusing on maximizing efficiency for motor vehicles at the expense of other travel modes. A growing body of research is now exploring how urban goods movement can be integrated into the complete streets conceptual framework. Alison Conway of the City College of New York recommends conducting corridor studies to identify where urban bicycle and freight networks overlap, as these can be key points of conflict for infrastructure design.[40] In addressing specific goods movement needs when designing or changing infrastructure, Conway recommends adhering to seven overarching themes:

- selecting a design and control vehicle;
- supplying adequate space for safe large vehicle turns;
- reducing the frequency of severity of conflicts between large vehicles and vulnerable roadway users;
- reducing speeds without unintended detrimental impacts on operations and safety;
- supplying network connectivity and redundancy;
- supplying adequate space for vehicle parking, loading, and delivery operations; and
- supplying safe access to sidewalks and buildings.

Teran (2015) notes several areas of overlap where urban goods movement and complete streets design can coexist.[41] Implementing road diets, for example, can increase traffic flow while reducing vehicle speeds and providing space for walking, bicycling, transit, and parking. When addressing complete streets design, planners and designers should identify the intersections that are most often used for goods movement and design the curb radius to suit the needs of trucks. Even intersections in locations with less goods movement traffic can be designed with multimodal considerations in mind, ensuring that adequate infrastructure is provided for all users, including trucks. In dense downtown areas, parallel streets can be designed as one-way couplets, with one street serving slower-moving traffic such as bicycles and pedestrians and the other serving trucks and other less vulnerable roadway users. Truck-serving streets would supply better curb access to allow for efficient loading and unloading.[42]

Four of the US EPA Smart Growth principles pose notable safety challenges when urban goods movement is considered. Implementation of Principles 1 through 4 (Mix land uses; Take advantage of compact design; Create a range of housing opportunities and choices; Create walkable neighborhoods) could result in the closer proximity of pedestrians and bicyclists to delivery trucks. Most bicycle-truck collisions occur in urban areas, suggesting that the higher collision rate is a function of greater exposure of bicyclists to truck activity in urban areas.[43] By increasing the density of urban environments, mixing land uses, increasing housing supply, and enhancing walkability and bicycle access through smart growth initiatives, planners and policy makers may ultimately increase the exposure of bicyclists and pedestrians to trucks. Careful consideration must be taken to manage interactions between trucks and the most vulnerable roadway users to maximize safety for everyone. As previously mentioned, designated truck routes may be helpful in achieving this end. **Figure J.3** shows the proximity between bicycles and trucks that can occur in urban areas, even when dedicated bicycle infrastructure is provided.

Figure J.3. Bicycle-Truck Proximity on Urban Streets



Source: Transportation Research Procedia

A major barrier for the urban goods movement industry that contributes to traffic congestion and safety concerns is access to the curb for freight loading and unloading. The demand for curb space has increased in recent years considering the advent of TNCs such as Uber and Lyft and the growing volume of package deliveries spurred by the e-commerce boom. When delivery trucks are unable to access the curb or loading zone at their destination, they often double park and occupy a travel lane, which increases congestion and potentially reduces safety by limiting visibility in the roadway and forcing cars to travel around double-parked trucks. On streets with bicycle lanes, delivery trucks may effectively block these lanes when double-parked or may be required to pass through them to access the curb, posing safety concerns for bicyclists in both cases by increasing collision risk and forcing bicyclists to mix with vehicular traffic (**Figure J.4**).[44]

Figure J.4. Curbside Bicycle Lane Complicates Truck Access to the Curb

Source: Santa Monica Next

These problems are compounded in the case of destinations with high curbside delivery demand and vehicle turnover, such as multi-tenanted buildings, which typically generate more deliveries than single-tenant buildings. If multi-tenanted buildings do not have internal logistics staff to manage deliveries, drivers must deliver goods to wherever recipients are located within the building. This may add to the expected delivery time while also increasing emissions associated with vehicle idleness, and further blocks lane access.[45] Additionally, in situations where double-parking is not possible and the curb or loading zone is occupied, delivery trucks may take unnecessary trips around the block while waiting for delivery access, resulting in an increase in greenhouse gas emissions. According to the Institute of Transportation Engineers (ITE), "it is becoming increasingly important to designate loading zones not only in commercial or industrial areas, but also in residential areas where the frequency of package deliveries may result in blockages for other curbside uses".[46]

Given the increasing competition for curb space and the negative impacts it has had on urban goods movement, urban planners and policy makers are increasingly looking towards tools under the umbrella of 'curbside management' to reduce these impacts while simultaneously working toward achieving smart growth goals. In the Curbside Management Practitioners Guide, the Institute of Transportation Engineers (ITE) recommends several strategies for ensuring the availability of curb space for urban goods deliveries:

Freight Zone Pricing
Requiring payment for access to freight loading and unloading zones has the dual effect of reducing the duration of loading zone occupancy and increasing the likelihood that loading space will be available when needed.

Off-peak Delivery and Congestion Pricing
By charging delivery vehicles a fee to deliver goods during peak periods, cities may effectively incentivize delivery during off-peak periods, thus reducing peak-period congestion. Potential benefits to delivery carriers of switching to off-peak delivery include increased parking/loading zone availability, reduced traffic congestion, and faster travel times with attendant reductions in the time needed to complete delivery routes.

Delivery Vehicle Staging Zones
Providing time-limited on-street queueing areas for delivery trucks at high-demand locations can prevent trucks from blocking travel lanes or driving unnecessarily while waiting for access to the loading/unloading zone.

Urban Consolidation Centers for Last Mile Delivery
The rapid increase in e-commerce deliveries in recent years has worsened problems related to last-mile deliveries, which increase competition for road space between urban passenger and freight traffic. To address this, Urban Consolidation Centers (UCCs) bring together packages from a multitude of delivery companies and provide last-mile delivery service using relatively smaller, low-emission vehicles that reduce competition for road space. UCCs are often formed through public-private partnerships between local governments and delivery companies.

Moving Loading and Access Around the Corner
Many delivery drivers are willing to park farther away from their delivery destination if it means they will not have to waste time waiting for loading space to become available. By moving loading and unloading zones at a reasonable distance away from delivery destinations, cities can preserve curb space for high-turnover parking and transit use while reducing goods movement inefficiencies.

Much of the guidance from the Transportation Research Board (TRB) about curbside management overlaps with that of the ITE. However, TRB also recommends allowing delivery vehicles to use off-street parking, setting up appointment- or reservation-based systems for deliveries, and using zoning to increase loading bay sizes to accommodate larger trucks and greater truck volumes.[47] Leonardi et al. (2014) recommends using joint procurement and internal logistics operations for large multi-tenanted buildings to reduce delivery vehicle dwell times.[48]

New York City has had remarkable success in using curbside management and other policies to manage urban goods movement and achieve smart growth goals. After forming the New York City Department of Transportation (NYCDOT) Office of Freight Mobility in 2007, the City created a Commercial Vehicle Parking Plan which recommended allocating more curb space

for commercial vehicles and using a pricing strategy with an escalating rate structure to maximize turnover of commercial vehicle parking. Combined, these measures have reduced commercial vehicle double-parking and dwell times and have increased parking availability, effectively reducing the need for delivery vehicles to circulate around the block while waiting for loading/unloading space to become available.[49] In addition to curbside management policies, NYCDOT established the 'THRU Streets' program in 2002, which designates certain streets in midtown Manhattan for cross-town travel while other streets are reserved for truck loading and unloading. This is similar to the idea of 'layered networks,' which is based on the recognition that streets cannot always prioritize all users. Instead, the layered networks concept "envisions streets as systems, each street type designed to create a high-quality experience for its intended users".[50] Implementation of the 'THRU Streets' program resulted in major improvements to traffic flow in congested Manhattan and has improved safety by reducing conflicts between turning vehicles and pedestrians.[51]

The City of Portland has implemented truck signal priority along major urban freight corridors to improve safety by reducing the likelihood of trucks running red lights and enhancing the efficiency of freight movement by reducing delay experienced at traffic signals. Additionally, the City collects city-wide freight logistics data that it plans to use to develop a coordinated freight management system to manage deliveries and prevent double-parking of trucks at the curbside.[52]

National Cooperative Highway Research Program (NCHRP) Report 844 presents case studies of the integration of goods and services movement by commercial vehicles in smart growth environments for six metropolitan areas in the United States across six key smart growth classifications: industrial areas transitioning to housing and entertainment districts; working waterfronts transitioning to mixed-use and/or recreation; older commercial and neighborhood areas being revitalized; retrofitting aging commercial corridors; greenfield new communities; and large scale construction.[53] In the Brady Arts District in Tulsa, Oklahoma, a former rail-served industrial and commercial area transitioned into an arts and entertainment district over a period of 20 years and faced challenges in the form of increased truck traffic during construction, reluctance from residents to retain freight-serving uses in the area, and conflicts between residential and commercial uses. In addressing these challenges, the City found that developing delivery and loading regulations could be useful for managing conflicts at the curbside in the future and innovative funding strategies such as tax increment financing could be used to improve walkability and safety with limited other financial resources. The City also determined that certain industrial uses could be used as buffers between municipal land uses and more intense industrial uses.[54]

In the Ballard neighborhood of Seattle, Washington, what was once a major hub for the maritime industry has recently been a site of major population growth with attendant increases in land and housing prices, which has created challenges for the maritime industry and the working-class neighborhoods that have historically existed in the area. Additionally, the street network is ill-equipped to accommodate freight delivery to new businesses in the neighborhood, creating challenges for shippers. To address these challenges, the City has

chosen to prioritize which streets in the neighborhood should be 'Complete Streets,' enhancing some streets for industrial and commercial needs and others for multimodal transportation. Additionally, the City is using zoning to ensure that the neighborhood can keep important industries like the maritime industry while barring incompatible uses.[55]

Technological Impacts

In addition to policy-based tools like curbside management, technological and logistical innovations may also play a role in aligning smart growth goals with urban goods movement priorities. From a logistical perspective, two innovations that promise to reduce delivery vehicle volumes, dwell times, and demand for curb space are: 1) the use of neighborhood pickup points, and 2) automated parcel systems as alternatives to home deliveries. Neighborhood pickup points are typically local shops or other convenient destinations where customers can receive and/or return deliveries.

Automated parcel systems are locker banks that are typically found in shopping centers or large easily accessible public destinations. Carriers leave packages in secured lockers which customers can unlock to receive their delivery using a digital code provided by the carrier. Advantages of neighborhood pickup points and automated parcel systems include eliminating instances of missed deliveries and consolidation of shipments from a carrier to a single location, which maximizes time and financial efficiency.[56] While the implementation of these logistical innovations could supply multiple benefits to the goods movement industry while advancing smart growth goals, their widespread adoption is not guaranteed.

In addition to neighborhood pickup points and automated parcel systems, several new startup companies have emerged with the goal of optimizing package delivery in large urban developments, especially in multifamily developments where tenants are increasingly demanding secure package delivery. Many of these companies are using the model of partnering with multifamily property owners and managers to install secure lockers within buildings and providing tenants with personal access codes to retrieve their deliveries.[57, 58] Independently of these companies, many multifamily buildings are installing their own ground floor package rooms or lockers where tenants can pick up their deliveries. Figure 5 shows an example of an Amazon Hub package locker in a multifamily development. [59]

Figure J.5. Amazon Hub package locker

Source: The Wall Street Journal

From a technological perspective, several new innovations hold promise for aligning smart growth and urban goods movement goals:

1. The use of local, alternatively-fueled autonomous vehicles for making deliveries has been promising. A startup called Udelv began testing grocery delivery using autonomous vehicles in San Mateo, California in partnership with Draeger's, a local grocery store chain, in 2018 and will soon deploy autonomous delivery vehicles in Oklahoma City as well.[60, 61] National grocery store chain Kroger has also been testing unmanned AVs to deliver groceries to customers in Arizona.[62] By serving multiple customers with a single autonomous delivery vehicle, both traffic congestion and greenhouse gas emissions can be reduced.
2. 3D printing allows certain goods to be effectively manufactured at or near the place where they will be consumed, thus reducing delivery trip length or eliminating the need for delivery altogether. German logistics carrier DHL states that the "future commercial viability of 3D printing and its mainstream adoption will be dependent on critical success factors such as affordability, material versatility, and the speed and quality of the print," but maintains that many companies are showing growing interest in this burgeoning technology as part of their future business models.[63]

3. The use of bicycling to carry cargo in inner cities is being tested. In its European operations, DHL is piloting a model that relies on a DHL van to deliver trailers full of goods to the city-center, where containers with packages can be attached to cargo bicycles for delivery, reducing VMT and associated noise and emissions.
4. Amazon and other companies are testing the use of unmanned aerial vehicles, or drones, for deliveries. The company's first fully autonomous home delivery without the use of a human pilot was conducted in 2017, but the timing of widespread implementation of the service is not yet publicly known.[64] Amazon's tests have used battery powered drones, which will need frequent battery recharging if the service is deployed on a large scale. If the company switches to using fossil fuels to power its drones, the emissions consequences of the service could outweigh the benefits. Despite the potential negative consequences of drone deliveries, modifications to the building stock to accommodate drone delivery has already begun in some metropolitan areas. In Miami, Florida, for example, a developer is designing a 60-story residential tower to include a rooftop takeoff and landing strip for drones.[65]

Research Gaps

Several important research gaps exist that merit future exploration. The first pertains to the lack of California-specific information concerning the intersections of smart growth and urban goods movement. Currently, few case studies have been conducted that examine California cities. Future studies that focus on California could inform policy and planning decisions in ways that maximize smart growth and urban goods movement outcomes within the state's unique context.

Another important research gap pertains to the safety implications of new technologies like autonomous vehicles. Existing research and technological development have focused on ensuring that autonomous vehicles can detect other vehicles and key infrastructural features such as traffic signals, signs, and roadway striping. However, comparatively little investment has been made in ensuring that autonomous vehicles can operate safely in truly multimodal environments where pedestrians and bicyclists share the road with motor vehicles. As autonomous vehicle technology is adopted by the urban goods movement industry, safety in urban environments will become an important consideration, and future research should specifically examine the intersections between technology, urban goods movement, and safety.

Lastly, future research would do well to examine intersections between smart growth, urban goods movement, and disaster resilience and emergency response. The existing literature on the subject offers competing claims about the vulnerability of dense urban areas to natural disasters and emergency response situations. Some studies have concluded that higher density in urban areas leads to greater vulnerability to natural disasters, while others have concluded that increases in infrastructure density reduce vulnerability.[66, 67] At least one study has concluded that the agglomeration economies found in dense urban areas lead to improved risk management and preparedness for emergency situations.[68]

Importantly, many of California's densest cities are in coastal areas, which increases their vulnerability to sea level rise, and suggests that the location, as well as the form, of cities affects their vulnerability. Additionally, if the frequency and intensity of wildfires in California continue to increase, there may be impacts on urban goods movement including delivery delays and implications for the siting of fulfillment centers and route choices. Research into these impacts could help the urban goods movement industry take a proactive approach in planning for emergency preparedness and reducing negative impacts.

As previously mentioned, NCHRP Report 844 presents case studies of the integration of goods and services movement by commercial vehicles in smart growth environments for six metropolitan areas in the United States.[69]

Importantly, none of the case study metropolitan areas are in California. Pilot studies in California cities covering some or all the smart growth classifications presented in NCHRP Report 844 would allow for the preparation of recommendations and guidance that are specific to the California context and would help the urban goods movement industry navigate smart growth challenges in California.

Conclusions and Recommendations

As the global trend toward urbanization continues, urban transportation is evolving at a rapid rate, and this has important implications for urban goods movement and the achievement of smart growth goals. The demand for goods in urban areas is greater than ever and shows signs of further growth as e-commerce continues to increase its share of the retail industry. Most e-commerce institutions and employees are in California, underscoring the importance of efficient urban goods movement to the health of the state's economy. However, despite the economic importance of urban goods movement, the aims of the goods movement industry have often been seen by urban planners and policy makers as being at odds with smart growth goals. Recently, with growth of TNCs and their approach to maximize the utilization of vehicles, there are new opportunities to integrate small urban deliveries with passenger transportation services. However, this is a still a new concept and require further investigation to evaluate its benefits and impacts.

To this end, the needs of the urban goods movement industry have often been overlooked in planning decisions, and this has the potential to be detrimental to the industry and to the economy. With new technological advancements like autonomous vehicles and other innovations on the horizon, urban transportation and the goods movement industry will both be transformed in foreseeable and unforeseeable ways, making the alignment of smart growth and urban goods movement goals fundamental to ensuring that California's cities maximize livability and economic health in the future. A summary of issues and associated recommendations for making smart growth and goods movement more compatible, as discussed in this paper is presented in **Table J.1**.

Table J.1. Key Issues and Solutions Associated with Aligning Smart Growth and Urban Goods Movement Priorities and Outcomes

Recommendations	Issues Addressed			
	Traffic Congestion	Traffic Safety	Competition for Curb Space	Greenhouse Gas Emissions
Planners and policy makers can take the needs of goods movers into account more explicitly when making infrastructure decisions (i.e., choose alternate freight routes where appropriate, supply adequate space for large vehicle turns and loading/unloading, provide network connectivity and redundancy)	✓		✓	
Implement road diets	✓	✓		
Prioritize certain intersections for freight movement	✓	✓		
Utilize off-peak delivery and congestion pricing	✓		✓	✓
Utilize urban consolidation centers for last mile delivery	✓		✓	
Move loading and curbside access around the corner	✓		✓	
Allow delivery vehicles to use off-street parking	✓		✓	
Develop neighborhood package pickup points, multifamily residential package rooms, and automated parcel systems	✓		✓	
Develop neighborhood 3D printing centers	✓		✓	✓
Utilize drone deliveries	✓	✓	✓	✓
Conduct corridor studies to find places where the urban freight and bicycle networks overlap		✓		
Implement truck signal priority and/or bicycle signal priority		✓		
Use low-intensity industrial land uses as buffers between high-		✓		

intensity industrial land uses and municipal land uses				
Implement freight zone pricing			✓	
Develop delivery vehicle staging zones	✓		✓	
Implement appointment- or reservation-based systems for deliveries	✓		✓	
Utilize joint procurement and internal logistics operations in large multi-tenanted buildings			✓	
Allocate added curb space for commercial vehicles				✓
Utilize alternatively-fueled delivery vehicles and/or autonomous delivery vehicles				✓
Source: Summary Analysis by Fehr and Peers				

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Appendix K. Future Freight System Scenarios

During the outreach and engagement process, stakeholders voiced concerns about the volume, impact, and conflicts of disruptive trends facing the freight industry. These trends (described in **Chapter 4**) create challenges for making long-term public and private investments in California's freight industry. Robotics and automation are likely to result in reductions of jobs and parking, which may generate opportunities to reduce parking supplies and a need to retrain our workforce. The uncertainty of future conditions in our era requires creative thinking for effective long-range planning. Shifts in societal and/or technological standards may drastically alter freight dynamics and volume. Accurate planning requires an understanding of the impacts to prepare for the "what if" scenario.

The CFAC members recommended developing a Freight Scenario Modeling Technical Advisory Subcommittee to discuss the most relevant trends and identify scenarios for further analysis. Four meetings were held with the Subcommittee to discuss the necessity and importance of evaluating several possible scenarios as the context for the CFMP., The Subcommittee discussed how different trends could impact freight flows from various aspects, such as cargo sourcing, a destination of the cargo, mode and routing, total volume and shipment size (see **Table K.1**).[1] Based on this guidance, the following scenarios were developed based on the following recommended characteristics:

- Decision making: capture the right decision
- Plausibility: within realistic limits
- Alternatives: no favorites or preferences (unofficial/official)
- Consistency: internal logic is aligned
- Differentiation: structurally different
- Memorability: easy to recall (name helps)
- Challenge: push against established

Scenario Evaluation Methodology and Available Tools

The Subcommittee's selection of the CFMP 2020 scenarios focused on the ability to quantitatively analyze, compare, and contrast differences using available data and tools.

The California Statewide Freight Forecasting Model and the California Statewide Travel Demand Model (CS2FDM, 2019) were integrated in 2020. The integrated model is validated for base year 2015 and future base year 2040, and it provides a consistent platform for statewide analysis. The CS2FDM will be the main tool to evaluate these scenarios. This is a transportation model; therefore, the economic elasticity of the supply chain to various factors– such as impacts of immigration or housing policies on population and job market or impacts of trade policies on import and export flows– needs to be evaluated in advance. Economic conditions of each scenario must be studied carefully and translated into basic model indicators such as population, employment, the capacity of facilities, the tonnage of goods to/from ports, a payload of trucks for different commodities, etc.

It is also important to consider available data, technical tools and resources, and the schedule for developing the most relevant alternative future scenarios and their respective analyses. Each scenario includes several elements. These elements are highly correlated and assumed to generate similar impacts on freight flows. The dynamic nature of the multifaceted freight industry complicates a scenario analysis, as some trends will create contradicting impacts on freight flows. To conduct meaningful analysis, it is important to clearly define the assumptions in each scenario and only change the specified elements with all else remaining constant.

Table K.1. Freight Flow Patterns

How can an event impact Freight Flows?	• Impact on sourcing patterns: Where are raw products and WIP sourced from? Are materials sourced in or out of the region?
	• Impact on flow destination: Where is the demand located? How are final destination locations distributed?
	• Impact on routing: How is freight moved within the region? Are there intermediate shipment points or mode switches?
	• Impact on flow volume: How will the total volume of freight shipped in and through the region change?
	• Impact on value density: How will the product characteristics change? How does the value density change?
Source: National Academies of Science, Engineering, and Medicine 2013	

Final CFMP 2020 Scenarios

The Subcommittee identified the following three scenarios to analyze:

- Land Use and Workforce Shift
- Trucking Operation on Freight Highway Network
- Emerging Modes in the Multimodal Freight System

The next steps involve clarifying and defining the assumptions and boundaries for each scenario, preparing input data, and identifying the methodology to evaluate each scenario in detail. The baseline assumptions for evaluating all scenarios are Existing Conditions (2015) and Future Baseline Conditions (2040).

The "Future 2040 Baseline Conditions" scenario includes:

- All RTP infrastructure projects
- MPOs' projections for employment and population
- Historic patterns of household characteristics and industry mix in each region
- Historic growth of the state, national economy, jobs and GDP
- Historic trends of imports and exports from each gateway

The results of the Subcommittee survey were used for the selection process and was shared with all CFAC members at the January 8, 2019, CFAC meeting. The three scenarios recommended by CFAC for analysis are described below.

Scenario 1: Land Use and Workforce Scenario

In this scenario, demand for the freight highway network deviates significantly from historic trends. The evaluation factors include changes in population and job balance for various industry sectors. These changes are anticipated to result in a severe transportation and warehousing workforce shortage in dense, urban areas. Under this scenario, workforces are predicted to migrate to lower density regions where housing is cheaper and more available. Conversely, urban areas may continue to reduce and restrict industrial development and shift wholesale and transport jobs to lower density rural areas. The focus areas may be (**Figure K.1**)[2]:

- In the Bay Area, the workforce and jobs are shifted from zones with high-median home value in Alameda, Contra Costa, San Mateo, Santa Cruz, and Santa Clara to the northern part of San Joaquin Valley.
- In Southern California, the workforces and jobs are shifted from the densest areas within Los Angeles County to the eastern edge of Los Angeles County, and to the surrounding, more affordable areas in San Bernardino, Riverside, and Northern San Diego Counties.

Input:

- Household candidates for migration were selected using the criteria detailed in **Table K.2**, wherein 25 to 100 percent of the new households (with at least one member working in blue-collar jobs) added between 2015 and 2040 are relocated based on household incomes.[3]
- The new home locations in Traffic Analysis Zones (TAZ) is probabilistically chosen by random drawings from a probability distribution with weights based on the proportion of low-income households (<$35k). The higher the proportion of low-income households, more likely it is to receive the migrating households.

Table K.2. Classification of Migration Candidates

Home County	Household Income (In 2010 $$)	Worker Condition	% of (2015-2040) Moved
Alameda, Contra Costa, San Mateo, Santa Cruz, Santa Clara	HH Income <$35k	At least one member working within this group	100%
Alameda, Contra Costa, San Mateo, Santa Cruz, Santa Clara	HH Income in ($35k, $75k)	At least one member working within this group	50%
Alameda, Contra Costa, San Mateo, Santa Cruz, Santa Clara	HH income >=$75k	At least one member working within this group	25%
Los Angeles, Orange	HH income <$35k	At least one member working within this group	100%
Los Angeles, Orange	HH Income in ($35k, $75k)	At least one member working within this group	50%
Los Angeles, Orange	HH income >=$75k	At least one member working within this group	25%
Medium	Workforce Issues	Changes in housing in California	3%
Medium	Workforce Issues	Workforce retraining and education	3%
Low	Workforce Issues	Retention of workforce/businesses in California	7%
Low	Workforce	Land use changes	14%
Source: The California Department of Transportation			

Figure K.1. The Shift of Workforce and Jobs from Dense, Urban Areas (Orange) to Rural Areas (Blue)

Source: Analysis and map created by Fehr & Peers, 2019; U.S. Census Bureau TIGER Traffic Analysis Zones, 2017; Esri base map, 2019.

Table K.3. Original Home Locations and Changed Home Location of Relocated Households (County-Level Stats)

New County Home									
Old Home County	**Merced**	**Sacramento**	**San Joaquin**	**Solano**	**Stanislaus**	**Yolo**	**San Bernardino**	**Riverside**	**Grand total**
Alameda	155	1,050	415	148	185	150			2,103
Contra Costa	76	545	224	70	135	81			1,131
San Mateo	65	421	156	41	78	56			817
Santa Clara	189	1,199	520	186	260	209			2,563
Santa Cruz	22	115	44	18	21	12			232
Los Angeles							18,132	18,755	36,887
Orange							4,183	4,259	8,442
Grand Total	**507**	**3,330**	**1,359**	**463**	**679**	**508**	**22,315**	**23,014**	**52,175**
Source: The California Department of Transportation									

Table K.3 shows the original and new home locations (county-level changes) of the 52,175 households that would be relocated. [4]

- The growth in wholesale and transport jobs between 2015 and 2040 in Northern California Counties (Alameda, Contra Costa, San Mateo, Santa Cruz, Santa Clara) and Southern California Counties (Los Angeles, Orange) is reduced by 50 percent.
- These jobs are then apportioned to the beneficiary counties (Merced, Stanislaus, San Joaquin, Sacramento, Solano, Yolo in the north and San Bernardino, Riverside in the south) using a proportion of 2040 jobs before the migration.
- These changes are also reflected in the occupation listing - blue-collar by adjusting the counts by delta (wholesale jobs + transport jobs), assuming all the wholesale and transport jobs fall under the blue-collar category.
- The total number of population and jobs remain as the 2040 Baseline conditions proposed by MPOs. This scenario only shifts the lower income households and transportation jobs

- The import and export distribution from major gateways are also shifted proportionally to these new TAZs since the warehousing capacity at new TAZs has increased and while it is relatively decreased in other TAZs. The total volume of imports and exports via each gateway remains like the 2040 Baseline conditions.

Output

The following metrics would be evaluated for the percentage change at the regional, corridor or statewide level before and after:

- Population by income group
- Employments by industry
- Total VMT/truck VMT
- Volume on selected corridors (I-80, I-580, I-710 and I-605, I-10, I-5)
- Travel time/delay › Emissions/GHG

Scenario 2: Trucking Operations on the Freight Highway Network
This scenario assumes a freight highway network that deviates significantly from historic trends. This scenario also anticipates a large-scale impact on the planning and implementation of regional or statewide infrastructure projects or policies that affect trucking operations on the Freight Highway Network. When focusing on delivery, the majority of the costs consist of fuel and wages – both of which are heavily influenced by prevailing market forces.

One solution to reduce the cost and to increase the efficiency is dedicated truck facilities which allow truck platooning and autonomous trucks. Based on previous studies, the use of cooperative adaptive cruise control (CACC) by platooning and autonomous trucks could increase highway capacity and decrease traffic congestion. With 50 percent market penetration, highway capacity could increase by 22 percent, and with 80 percent penetration, it could increase by 50 percent.

This scenario assumes two major truck corridors have dedicated truck lanes between major freight hubs, and these dedicated lanes primarily serve platooning and autonomous trucks. These corridors are shown in **Figure K.2**. [5]

- Truck routes in Northern California, connecting the Ports of Oakland and Stockton with I-580, I-205, I-5 and SR 4.
- Truck routes in Southern California, connecting San Pedro Bay Ports of Long Beach and Los Angeles and the World Logistic Center in Moreno Valley with I-710 and SR 60.

Input

Network change to allow 100 percent platooning and autonomous trucks:

- On the above truck routes, change one of the existing general-purpose lanes to permanently dedicated truck lanes

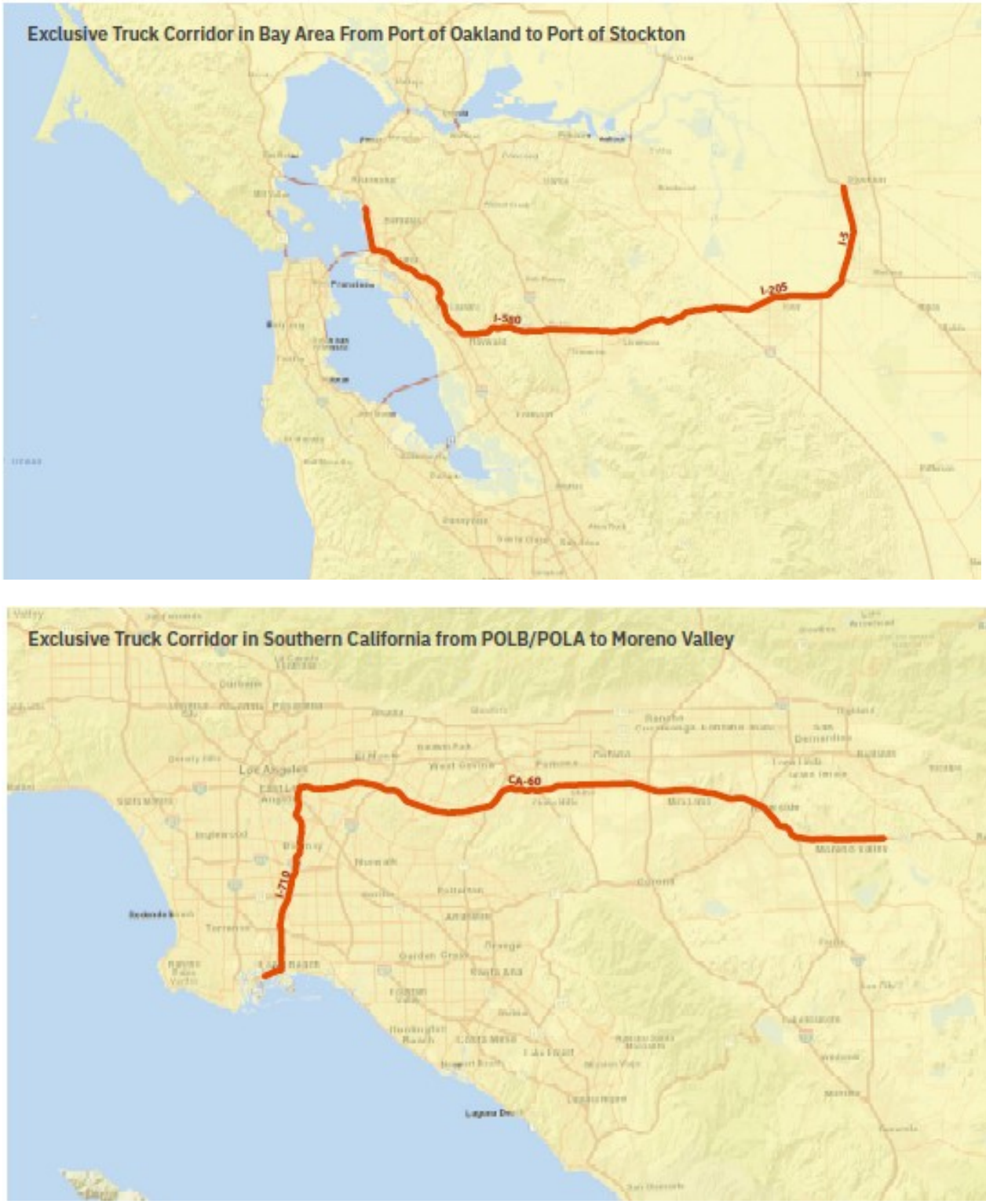
- Increase the capacity for the new truck only lanes by 50 percent to represent the change of vehicle mix in these lanes
- Decrease the cost of trucking by reducing the travel time by 30 percent

Output:

Changes at the regional, corridor or statewide level before and after are anticipated to be measurable in these four categories:

- Travel time/Delay
- Total and Truck VMT/VHT
- Regional traffic volume
- Mode split

Figure K.2. Truck Routes for Platooning and Autonomous Trucks



Source: The California Department of Transportation

Scenario 3: Emerging Modes in Multimodal Freight System
This scenario assumes alternative cargo movers are introduced into the multimodal freight system. The purpose is to evaluate the impact of policies that encourage modal shifts between trucking, maritime, rail, air and other urbanized modes, on the performance and operation of the highway system. This scenario analyzes the anticipated migration to electric trucks, the implementation of drone and robot deliveries, and the introduction of autonomous trucks.

Input

Update Origin-Destination Matrix and shift hours of service:

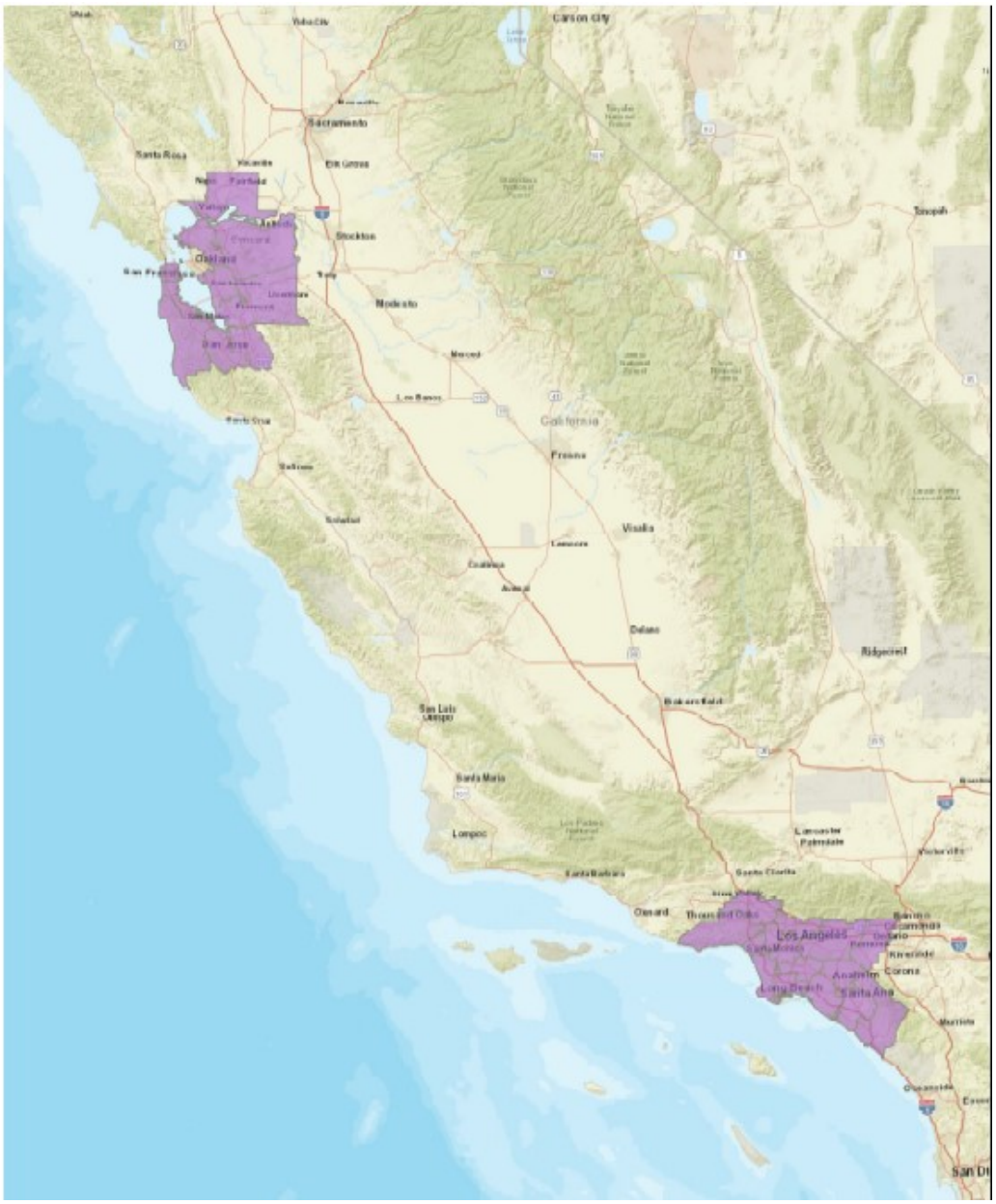
- The Bay area and Southern California are selected as the dense urban areas.
- 50 percent of light duty trucks that travel less than 10 miles are replaced by another mode of transport; this part of the trip is eliminated from the O/D matrix
- 50 percent of light- and medium- duty trucks that travel 10-50 miles will be replaced with autonomous cargo handling trucks that operate during off-peak periods. To implement this change in the model, 50 percent of trucks that fit this description are shifted to the off-peak period, which represents fewer congestion conditions. See **Figure K.3**. for a map showing the 50-mile buffer area from the Bay area and Southern California.

Output

Following metrics would be evaluated for the percentage change at regional, corridor or statewide level before and after:

- Regional Wide Volume
- Travel Time/ Delay
- VHT/ VMT
- Mode Split

Figure K.3. Defense Urban Areas with Alternative Cargo Movers that Travel Less than 50 Miles



Source: The California Department of Transportation

Endnotes

[1] National Academies of Science, Engineering, and Medicine 2013. *Strategic Issues Facing Transportation, Volume 1: Scenario Planning for Freight Transportation Infrastructure Investment.*

[2] Caltrans, Division of Transportation Planning, 2019. Analysis, summaries, and Mapping by Fehr & Peers

[3] Caltrans, Division of Transportation Planning, 2019. Analysis, summaries, and Mapping by Fehr & Peers

[4] Caltrans, Division of Transportation Planning, 2019. Analysis, summaries, and Mapping by Fehr & Peers

[5] Caltrans, Division of Transportation Planning, 2019. Analysis, summaries, and Mapping by Fehr & Peers

Appendix L: 2018 California Freight Investment Plan

Trade Corridor Enhancement Program (Trade Corridor Enhancement Account and National Highway Freight Program)

(1,000's)

						TCEP Funds		NHFP Funding Only		
CO	**Routes**	**Project Title**	**Project Description**	**Total Project Cost**	*** Matching Funds**	**TCEA Funds**	**NHFP Funds**	**2017-18**	**2018-19**	**2019-20**
ALA	7th Street	7th Street Grade Separation (East)	Reconstruct existing 4-ln underpass at the UPRR mainline tracks to meet current geometric standards.	$ 252,000	$ 77,000	$ 175,000	$ -			
ALA	Various	Freight Intelligent Transportation System	Install and implement ITS elements and other technologies, which include changeable message signs, closed circuit TV, fiber optic and Wi-Fi communications, traffic signal enhancements, vehicle and queue detection, train queue detection, weight-in-motion, information application, and smart parking system.	$ 30,600	$ 18,144	$ 12,456	$ -			
ALA	Various	Quiet Zone Safety Engineering Measures	Install 4 quadrant gates, raised median, and sidewalks at three at-grade railroad crossings.	$ 6,480	$ 2,280	$ 4,200	$ -			
KER	SR 58 / 99	Rt 58 / 99 Bakersfield Freeway Connector	Grade separate exit and entry ramps, construct southbound auxiliary lane, 2-lane collector-distributor road, retaining walls, and widen bridge.	$ 50,000	$ 25,000	$ 500	$ 24,500	$ 24,500		
MER	SR 99	Rt 99 Livingston Widening, north bound	Widen 7.65 miles to 3 lanes, northbound direction only	$ 37,420	$ 8,370	$ -	$ 29,050		$ 29,050	
SJ	Fyffe Ave	Fyffe Ave Grade Separation	Replace an at-grade crossing with a new grade separated overcrossing.	$ 13,000	$ 4,000	$ 9,000	$ -			
SJ	I 205	205 / International Parkway Interchange Improvements	Widen ramps, construct turn pockets, install bike/pedestrian improvements, and signal modification.	$ 15,690	$ 8,090	$ 7,600	$ -			
SJ	I 580	580 / International Parkway Interchange Improvements	Widen ramps, construct turn pockets, install bike/pedestrian improvements, and signal modification.	$ 8,970	$ 3,790	$ 5,180	$ -			
SCL	US 101 / SR 25	Rt 101 / 25 Interchange Improvements Ph 1	Construct/relocate interchange (IC) N of the existing location by replacing a 2-ln bridge with 4-ln bridge / IC construct aux ln, modify /construct frontage roadway, install bike lns, sidewalks, and traffic signals	$ 65,000	$ 60,800	$ 4,200	$ -			
SOL	Rt 80/680/12	Rt 80/680/12 Interchange, Package 2A	Construct a new 2-ln hwy alignment and bridge, off-ramp, install ramp metering and changeable message signs, and braided ramp connection.	$ 76,000	$ 22,800	$ 53,200	$ -			
STA	SR 132	Rt 132 West Freeway / Expressway Ph 1	Construct new 2-ln expressway with full access control and grade separation divided highway.	$ 149,400	$ 128,400	$ 21,000	$ -			
LA	LA Metro	Southern Terminus Gap Closure	Add 5000 feet of main line track.	$ 9,529	$ 3,537	$ -	$ 5,992		$ 5,992	
LA	LA Metro	Terminal Island Railyard Enhancements	Add 31,000 feet of on-dock staging/storage tracks.	$ 34,015	$ 12,370	$ -	$ 21,645		$ 21,645	
LA	LA Metro	Pier G & J Double Track	Add 9,000 feet of double track.	$ 25,000	$ 11,000	$ -	$ 14,000		$ 14,000	
LA	Montebello Blvd	Montebello Boulevard Grade Separation	Replace an at-grade crossing with a new grade separated undercrossing.	$ 128,611	$ 79,611	$ 49,000	$ -			
LA	Turnbull Canyon Rd	Turnbull Canyon Road Grade Separation	Replace an at-grade crossing with a new grade separated overcrossing. Add sidewalks/bike lanes.	$ 86,246	$ 57,246	$ 29,000	$ -			
LA	Rosecrans/ Marquardt	Rosecrans/Marquardt Grade Crossing	Replace an at-grade crossing with a new grade separated crossing.	$ 155,300	$ 146,300	$ 9,000	$ -			
LA	I 605 / SR 91	Rt 605 / 91 Interchange Improvement: Gateway Cities Freight	Add new general purpose and/or auxiliary lanes and modify on and off ramps.	$ 187,800	$ 155,800	$ -	$ 32,000		$ 32,000	
LA	I 5	Rt 5 Golden State Chokepoint Relief	Add truck lanes, HOV lns, aux lns, soundwalls, and an ITS hub station. Widen 7 bridges and improve access to weigh	$ 539,200	$ 292,200	$ 98,000	$ 149,000			$ 149,000
LA	SR 71	Rt 71 Freeway Conversion	Add 1 HOV and 1 mixed flow ln in each direction, close 3 at-grade crossings, install sound walls and pedestrian bridge.	$ 175,519	$ 131,519	$ 44,000	$ -			
LA	SR 57 / 60	Rt 57 / 60 Confluence: Chokepoint Relief Program	East bound improvements include interchange modifications, aux. lanes and 3 new bridges.	$ 288,600	$ 266,600	$ 22,000	$ -			
ORA	SR 57	Rt 57 / Lambert Road Interchange Improvement	Install aux lanes, modify ramps and widen Lambert Rd to accommodate future truck climbing lane.	$ 100,000	$ 34,295	$ -	$ 65,705		$ 65,705	
RIV	SR 60	Rt 60 Truck Safety and Efficiency, Phase 1A	Replace 50 yr old with new 6-ln bridge, reconfigure the N side of the 60/Moreno Beach Dr IC and construct aux lns.	$ 24,000	$ 7,200	$ 16,800	$ -			
SBD	US 395	Rt 395 Widening from SR 18 to Chamberlaine Way	Widen 395 from 2 to 4-lns, construct turn lanes, and install signals.	$ 52,321	$ 28,029	$ 24,292	$ -			
SBD	I 10	Rt 10 Corridor, Contract 1 (Express Lanes)	Add two express lanes and auxiliary lanes.	$ 625,400	$ 507,569	$ 13,515	$ 104,316	$ 104,316		
SBD	Etiwanda Ave	Etiwanda Avenue Grade Separation	Replace an at-grade crossing with a new grade separated overcrossing. Add 1,700 feet of sidewalks/bike lanes.	$ 60,000	$ -	$ 60,000	$ -			
VEN	SR 34	Rt 34 (Fifth St) / Rice Avenue Grade Separation	Grade separate existing overcrossing and widen from 4 to 6-lns, install connector roads, signals, and sidewalks.	$ 79,192	$ 12,109	$ 67,083	$ -			
SD	Rt 125/905	Rt 125/905 Connector	Construct freeway to freeway South-West Connector.	$ 36,255	$ 14,275	$ 21,980	$ -			
SD	SR 11	Rt 11/Siempre Viva Interchange and Commercial Vehicle Enforcement Facility, Seg 2B	Construct new interchange and begin site prep for the CVEF, which includes drainage and utilities.	$ 45,400	$ 8,282	$ 37,118	$ -			
SD	Otay Mesa East POE	Otay Mesa East Port of Entry Segment 3A	Begin site preparations which include drainage and utilities.	$ 40,350	$ 35,300	$ 5,050	$ -			
SD IMP	POEs	Advanced Technology Corridors at Border POEs	Implement a fiber optic cable network to facilitate an advanced traveler information and border wait time system.	$ 39,175	$ 27,206	$ 11,969	$ -			
IMP	SR 98	Rt 98 Improvements	Widen 98 from four to 6-lns, install associated sidewalks, Class II bike lanes, and curb ramps.	$ 11,650	$ 8,280	$ 3,370	$ -			
IMP	Calexico East POE	Calexico East POE Truck Crossing Improvement	Widen bridge to add truck lanes and passenger lanes along with eight foot shoulders.	$ 29,844	$ 26,844	$ 3,000	$ -			
SD	SANDAG	Sorrento to Miramar, Ph2 Intermodal Improvements	Add 1.9 miles of double track in slowest area, install signal improvements and retaining walls.	$ 129,037	$ 118,537	$ 10,500	$ -			
SD	City of San Diego	Otay Mesa Truck Route, Phase 4A	Widen and pave existing service road, redirect laden/unladen trucks on dedicated route.	$ 19,530	$ 13,530	$ 6,000	$ -			
SD	SD Unified Port District	National City Marine Terminal Rail Track Extension	Construct connector track and realign Marina Way.	$ 13,120	$ 12,535	$ -	$ 585		$ 585	
SD	SD Unified Port District	10th Ave Marine Terminal Beyond Compliance Environmental	Expand shore power and purchase "Bonnet" system.	$ 8,100	$ 2,500	$ -	$ 5,600			$ 5,600
SB	US 101 / SR 25	Rt 101 Multimodal Corridor	Construct HOV lanes between Carpentaria and Santa Barbara, reconstruct or replace bridges and overcrossing, install	$ 276,575	$ 225,575	$ 51,000	$ -			
SHA	I 5	Rt 5, Redding to Anderson Widening, Ph 2	Widen road and structures from 4 to 6-lns, replace 2 bridges, and install closed circuit TV and fiber optic cable.	$ 126,258	$ 60,558	$ -	$ 65,700	$ 65,700		
			Total	$ 4,050,587	$ 2,657,481	$ 875,013	$ 518,093	$ 194,516	$ 168,977	$ 154,600

* Matching funds include state and local funds.

**All NHFP funded projects (highlighted in blue) were adopted by the California Transportation Commission into the Trade Corridor Enhancement Program and are fully funded with state and/or federal funds.

									CFMP Goal Alignment						
Project Reference ID	CFMP Region	Project Category	District	County	Route	Project Name	Project Description	Cost (1,000 USD)	Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
BA_001	Bay Area	Port Access	04	ALA	880	Freight Emission Reduction Action Plan: Recommended Regional Demonstrations	Urban Delivery Demonstration Project: Range Extended Electric Vehicle (REEV) for Medium Heavy Duty (Class 5-6) Trucks: Rail Demonstration Project: Yard Switcher Using Dual Mode Battery-Assisted Locomotive in West Oakland and Richmond. Grow Bay Area Near-Zero and Zero Emission Vehicle R&D Public/Private Clean Truck Collaborative	$54,000	X	X	X	X	X	X	X
BA_002	Bay Area	Port Access	04	ALA	OFF	Minor Freight Improvements Programmatic	This program includes projects that improve freight operations and reduce impacts of freight activity. This includes but is not limited to railroad quiet zones, multimodal safety projects at crossings, freight corridor upgrades, ITS improvements, terminal lighting, seismic monitoring, rail connections between Oakland and Niles Subdivisions, truck parking facilities, rail platforms, and other projects that would implement the Alameda CTC Goods Movement plan.	$51,000	X			X	X	X	X
BA_003	Bay Area	Port Access	04	ALA	OFF	7th Street Grade Separation West	The Project creates a new elevated intersection at 7th & Maritime Streets, and provides new rail access between the Oakland Army Base and the Oakland International Gateway. The Project shifts cargo from truck to rail, reduces truck congestion and emissions, and improves public access.	$263,000	X	X	X	X			X
BA_004	Bay Area	Port Access	04	ALA	OFF	Equipment-Based Reduction Projects	Categories for upgrade to zero or near-zero emission (focused on West Oakland, but could also include other communities) include: -Yard trucks -Tug boats (incl shore power) -On-road Class 5/6 trucks -Truck retirement project -Locomotives (Class 1&3) -Ocean-going vessels (bonnets and electrification) -Forklifts -Transport Refrigeration Units -Top/Side Pick Cranes	$200,000	X	X	X	X			X
BA_005	Bay Area	Port Access	04	ALA	OFF	Freight Emission Reduction Action Plan: Recommended Regional Demonstrations - Urban Delivery Demonstration Project: Range Extended Electric Vehicle (REEV) for Medium Heavy Duty (Class 5-6) Trucks: Rail Demonstration Project: Yard Switcher Using Dual Mode Battery-Assisted Locomotive in West Oakland and Richmond. Grow Bay Area Near-Zero and Zero Emission Vehicle R&D Public/Private Clean Truck Collaborative	Freight Emission Reduction Action Plan: Recommended Regional Demonstrations - Urban Delivery Demonstration Project: Range Extended Electric Vehicle (REEV) for Medium Heavy Duty (Class 5-6) Trucks: Rail Demonstration Project: Yard Switcher Using Dual Mode Battery-Assisted Locomotive in West Oakland and Richmond. Grow Bay Area Near-Zero and Zero Emission Vehicle R&D Public/Private Clean Truck Collaborative	$40,000	X	X	X	X	X	X	X
BA_006	Bay Area	Port Access	04	ALA	OFF	Oakland Army Base transportation infrastructure improvements	Constructs public improvements for trade, logistics and ancillary maritime services that promote cleaner modes of transportation, efficient goods movement, congestion relief on countywide freight corridors, new jobs, and fulfills a mandate to reduce truck trips through the West Oakland community.	$314,000			X	X		X	X
BA_007	Bay Area	Port Access	04	ALA	OFF	Marine Terminal Modernization	This project would fund upgrades at Marine Terminals including bollard and fenders, six shore power outlets, and LED lighting upgrades. This project would reduce the Seaport's carbon foot print and will continue to help the Region/State move towards achieving its zero emissions goal.	$74,000	X	X	X	X	X	X	X

The CFMP project list demonstrates alignment with the goals of the plan and not priority or commitment to future transportation funds.

									CFMP Goal Alignment						
Project Reference ID	CFMP Region	Project Category	District	County	Route	Project Name	Project Description	Cost (1,000 USD)	Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
BA_008	Bay Area	Port Access	04	ALA	OFF	Port Wide Electrification	This project will upgrade electrical infrastructure at the Port of Oakland to increase capacity needed to accommodate the electrification of Terminals and equipment utilized throughout all Port facilities (Seaport & Aviation). This project will help the Region & State move towards achieving its zero emissions goal.	$218,000	X	X	X	X	X		X
BA_009	Bay Area	Port Access	04	ALA	OFF	Roundhouse EV Charging Facility	To support future projections for increased implementation of ZE trucks, the Roundhouse Electric Vehicle (EV) Charging Facility project will explore development of freight electric vehicle charging standards and will include the design & construction of infrastructure necessary to establish a permanent electric vehicle/equipment charging facility at the Seaport's Roundhouse Property.	$12,000	X	X	X	X	X	X	X
BA_010	Bay Area	Port Access	04	ALA	OFF	Port of Oakland: Go Port	The GoPort project will reduce emissions from idling trucks, increase Port operational efficiency, and provide significantly improved truck and rail access. Project includes: Port of Oakland ITS improvements.	$550,000	X	X	X	X		X	
BA_011	Bay Area	Port Access	04	ALA	OFF	Port of Oakland Non-Equipment-Based Reduction Projects	Includes the following components: -Port Electrical Grid Improvements -Facility upgrades and emission reductions -Supply Chain Efficiencies- extended Marine terminal hours, grey chassis pool, gate modifications, and technology solutions -Extended gate hours/days	$100,000	X	X	X	X	X		X
BA_012	Bay Area	Port Access	04	ALA	OFF	Port Operational Efficiency Enhancements	This project includes a study, preliminary design & construction of infrastructure improvements at Maritime St., Grand Ave. & Adeline St. access points to Seaport facilities that will enhance operational efficiency at the Seaport.	$25,000	X	X		X			X
BA_013	Bay Area	Port Access	04	ALA	OFF	AirPort Drive Rehabilitation	This project consists of roadway overlay, cracking sealing, and some full depth reconstruction of approximately 3.3 miles of pavement mostly along the inbound and outbound AirPort Drive roadways, but also includes John Glenn Drive, Neil Armstrong Way, John Glenn off-ramp, return to terminal, and AirPort Access Road.	$6,000	X	X	X	X			X
BA_014	Bay Area	Port Access	04	ALA	OFF	Oakland International AirPort Perimeter Dike	This project will upgrade and improve the 4.5 mile long dike protecting OAK, terminal and other facilities, roadways, transit services & trails connecting Alameda and San Leandro. Includes seismic stabilization, FEMA compliance, and protection against climate change and sea level rise.	$53,000	X	X	X	X			X
BA_015	Bay Area	Port Access	04	ALA	OFF	Middle Harbor Road Improvements	This project identifies & implements solutions to the traffic circulation issues on Middle Harbor Rd. Solutions may include dedicated queue or turn lanes, signalization, and relocation or reconfiguration of terminal gates and recommendations for Adeline St. Bridge reconfiguration as appropriate.	$33,000	X	X	X	X			X
BA_016	Bay Area	Port Access	04	ALA	OFF	Seaport Near Dock Rail Enhancements	This project will connect Seaport Logistics Complex warehouse and transload facilities. These near dock rail enhancements will enable transload facilities to receive unit train loads. This project will support regional progress towards achieving the Region/County Goods Movement Plan Rail Strategy.	$8,000	X	X	X	X	X	X	X
BA_017	Bay Area	Port Access	04	ALA	OFF	Roadway Operations - This category includes projects that improve roadway, intersection, or interchange operations, ITS, as well as other transportation system management	Roadway Operations - This category includes projects that improve roadway, intersection, or interchange operations, ITS, as well as other transportation system management	$203,000		X			X	X	
BA_018	Bay Area	Port Access	04	ALA	OFF	7th Street Grade Separation East	Project replaces the substandard 7th St. roadway & pedestrian underpass at the north end of Railport Oakland Intermodal Yard (RO-IY). The new, depressed roadway allows for new rail crossings to improve connections to the future OHIT IY and project completes a missing segment of the Bay Trail.	$555,800	X	X		X	X	X	X

The CFMP project list demonstrates alignment with the goals of the plan and not priority or commitment to future transportation funds.

Project Reference ID	CFMP Region	Project Category	District	County	Route	Project Name	Project Description	Cost (1,000 USD)	CFMP Goal Alignment						
									Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
BA_019	Bay Area	Port Access	04	ALA	OFF	Multimodal Streetscape - Projects in this category implement multimodal or complete streets elements, including but not limited to projects such as Grimmer Boulevard Greenway, Telegraph Avenue Complete Streets, West Grand Avenue Complete Streets, Hearst Avenue Complete Streets	Projects in this category implement multimodal or complete streets elements, including but not limited to projects such as Grimmer Boulevard Greenway, Telegraph Avenue Complete Streets, West Grand Avenue Complete Streets, Hearst Avenue Complete Streets	$461,000	X		X	X	X	X	X
BA_020	Bay Area	Port Access	04	CC	OFF	Local road and county road access and safety program on truck routes	Includes: Byron Highway and Camino Diablo Road	$40,000		X	X			X	
BA_021	Bay Area	Port Access	04	CC	OFF	County Safety, Security and Other - Projects in this category address safety, security and other needs such as Lone Tree Way Undercrossing, Marsh Creek Road Curve Realignment, Cutting/Carlson grade crossing improvements, San Pablo Avenue overcrossing, Vasco Road safety improvement, and Viera Avenue Realignment	County Safety, Security and Other - Projects in this category address safety, security and other needs such as Lone Tree Way Undercrossing, Marsh Creek Road Curve Realignment, Cutting/Carlson grade crossing improvements, San Pablo Avenue overcrossing, Vasco Road safety improvement, and Viera Avenue Realignment	$108,000			X		X	X		
BA_022	Bay Area	Port Access	04	MULT CO	OFF	Goods Movement Technology Program - Program for deploying communications infrastructure to increase active traffic management along freight corridors and to/from the Port of Oakland	Goods Movement Technology Program - Program for deploying communications infrastructure to increase active traffic management along freight corridors and to/from the Port of Oakland	$300,000	X	X	X	X	X	X	X
BA_023	Bay Area	Port Access	04	SF	OFF	Cargo Way Street Improvements	Reconstruct Cargo Way, which sees freight traffic from the Port's Piers 90-96 operations and adjacent industrial park, to facilitate improved access for all modes of traffic, improve the appearance, and treat roadway stormwater run-off, visually improving the area and creating habitat opportunities.	$20,000	X	X	X	X			X
BA_024	Bay Area	Port Access	04	SF	OFF	Pier 96 Seawall Replacement	Install a new seawall along Pier 96, on San Francisco's southeast waterfront to protect against sealevel rise and resist earthquakes. Pier 96 is a 76-acre site are used to import aggregate for infrastructure projects throughout San Francisco, berth Maritime Ready Reserve ships, and is home to Recology's recycling facility.	$40,500	X	X			X		X
BA_025	Bay Area	Port Access	04	SF	OFF	Pier 80 Fendering Improvements	Project upgrades the existing fendering system at Pier 80, along San Francisco's southeast waterfront. Improvements will better handle the roll-on/roll-off vessels berthing at this location and prevent risk of vessel damage.	$3,800	X	X					X
BA_026	Bay Area	Port Access	04	SON	OFF	Airfield Wildlife Fence - Design/Installation	STS Airport - Complete the installation of a full perimeter fence - wildlife fence Design/Installation	$850	X		X		X	X	X
BA_027	Bay Area	Port Access	04	SON	OFF	Apron E Reconstruction - Design	STS Airport - Design of Apron E reconstruction at the Airport	$450	X	X			X	X	X
BA_028	Bay Area	Port Access	04	SON	OFF	Runway 14-32 Overlay, Shoulders and Centerline Lighting	STS Airport - Runway 14/32 centerline lights design	$700		X				X	
BA_029	Bay Area	Port Access	04	SON	OFF	New ARFF Building	STS Airport - Final Design and Construction of the Aircraft rescue and firefighting facility	$8,000						X	X
BA_030	Bay Area	Port Access	04	SON	OFF	Terminal Ramp Reconstruction - Final Design and Construction	Final Design and Construction of the Airport terminal ramp	$5,800	X	X				X	X

The CFMP project list demonstrates alignment with the goals of the plan and not priority or commitment to future transportation funds.

									CFMP Goal Alignment						
Project Reference ID	CFMP Region	Project Category	District	County	Route	Project Name	Project Description	Cost (1,000 USD)	Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
BA_031	Bay Area	Port Access	04	SON	OFF	Temporary Hold Room - Design and Construction	STS Airport - Temporary holdroom to enable the airport to keep operating while the main terminal expansion is underway . This is for the Design and Construction	$3,400		X			X	X	X
BA_032	Bay Area	Port Access	04	SON	OFF	New ARFF Building - Project Formulation and Design	STS Airport - New Aircraft rescue and fire fighting facility to accommodate for terminal expansion. This is the project Formulation and Design	$750			X	X	X		
BA_033	Bay Area	Port Access	04	SON	OFF	New ARFF vehicle	STS Airport - Purchase of a new Aircraft rescue and firefighting vehicle	$750			X	X	X		
BA_034	Bay Area	Port Access	04	SON	OFF	Taxiway A Reconstruction/Overlay and Shoulders - Construction	STS Airport -re-Construction of Taxiway A	$25,000	X	X				X	X
BA_035	Bay Area	Port Access	04	SON	OFF	Taxiway A Reconstruction/Overlay and Shoulders - Design	STS Airport - Design of Taxiway A reconstruction will help aircraft of all types taxi-off or onto a runway	$350	X	X					X
BA_036	Bay Area	Port Access	04	SON	OFF	Permanent Hold Room/Baggage Area Expansion - Design and Construction	STS Airport - Expansion of the Terminal building, passenger holdroom and baggage area - Design and Construction	$25,000	X	X				X	X
BA_037	Bay Area	Port Access	04	SON	OFF	Apron F Reconstruction - Design and Construction	STS Airport - Design and Construction for one of the Airport's ramp	$4,195		X			X	X	X
BA_038	Bay Area	Rail Systems	04	ALA	OFF	City of Berkeley Railroad Crossing Safety Improvement Project	Implementation of Phase 1 of a Quiet Zone on the Union Pacific Railroad (UP) corridor through the City of Berkeley.	$12,410	X	X	X	X	X	X	X
BA_039	Bay Area	Rail Systems	04	CC	OFF	Targeted Operational Improvements - City of Hercules Third Track, and Upgrade water side drill track to 3 mainline between Port and Bancroft	Targeted Operational Improvements - City of Hercules Third Track, and Upgrade water side drill track to 3 mainline between Port and Bancroft	$60,000	X		X	X			X
BA_040	Bay Area	Rail Systems	04	MULT CO	OFF	Rail Connectivity Improvements	Industrial Parkway Connection Shinn Connection New wye connections at Lathrop and Stockton Junctions - not included in project cost since revenue assupmtions are not inclusive of SJ County	$240,000	X		X	X			X
BA_041	Bay Area	Rail Systems	04	NAP	OFF	County Safety, Security and Other	Railroad crossing safety upgrades, corridor and Safety Improvements	$4,000	X	X	X	X	X		X
BA_042	Bay Area	Rail Systems	04	SCL	OFF	Alviso Wetlands Doubletrack	Provide double track section on the UPRR Coast Subdivision from the Alameda County line to the vicinity of State Route 237. The improvements are expected to include double-tracking the segment running over the Alviso Wetlands.	$196,000	X		X	X			X
BA_043	Bay Area	Rail Systems	04	SON	OFF	SMART Rail Freight Improvements	Improvements along publicly-owned SMART rail right-of-way to accommodate rail freight services and expansions. Programmatic category that could include freight spurs, Positive Train Control/systems and crossing upgrades, track and sidings expansions and bridge improvements.	$90,000	X	X	X	X	X		X
BA_044	Bay Area	Grade Separations	04	ALA	OFF	Safety Improvements - Grade crossing improvements at Jack London Square and in Emeryville - City of Berkeley Railroad Crossing Improvements City of Berkeley Gilman Street Grade Separation City of Fremont Railroad Quiet Zones	Safety Improvements - Grade crossing improvements at Jack London Square and in Emeryville - City of Berkeley Railroad Crossing Improvements City of Berkeley Gilman Street Grade Separation City of Fremont Railroad Quiet Zones	$130,000	X	X	X	X	X	X	X
BA_045	Bay Area	Grade Separations	04	MULT CO	OFF	Railroad Grade Crossing Improvements and Grade Separations	Additional Grade Crossing Improvements	$150,000	X	X	X	X	X		
BA_046	Bay Area	Grade Separations	04	SCL	OFF	Caltrain Grade Separations	This project includes grade separations of the Caltrain right of way at priority locations throughout Santa Clara County	$800,000	X	X	X	X	X		X

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BA_047	Bay Area	Grade Separations	04	SM	OFF	Grade Separations	This project includes grade separations of the Caltrain right of way at approximately 2 to 3 high priority locations in San Mateo County, including 25th Avenue. This project is based on San Mateo County's Measure A grade separation category.	$260,000	X	X	X	X	X		X
BA_048	Bay Area	Inter/Intra-state	04	ALA	80	Ashby I-80 Interchange with Bicycle and Pedestrian Ramps	Reconstruct the Ashby Avenue interchange, including construction of a new bridge to replace existing bridges, a roundabout interchange, and bicycle/pedestrian access over the I-80 freeway at the Ashby-Shellmound interchange.	$60,000	X	X	X	X	X		X
BA_049	Bay Area	Inter/Intra-state	04	ALA	80	I-80 Gilman Street Interchange Improvements	The proposed project is located in northwest Berkeley and will reconfigure the I-80/Gilman interchange. The limits for the freeway and ramp traffic operations would include I-80 from east of Buchanan Street to west of University Avenue.	$42,000	X	X	X	X	X		X
BA_050	Bay Area	Inter/Intra-state	04	ALA	80	I-80 Increase Vertical Clearance at University Ave	In Berkeley, at University Avenue Overcrossing No. 33-0023. Establish standard vertical clearance. ACCELERATED BRIDGE (PA&ED Only)	$39,800	X	X	X	X	X	X	X
BA_051	Bay Area	Inter/Intra-state	04	ALA	92	SR 92/Clawiter Road/Whitesell Street Interchange Improvements	The project would reconstruct the SR 92/Clawiter Rd interchange to create the SR 92/Whitesell St interchange, addressing truck traffic access needs by: reconfiguring Clawiter/SR 92 interchange, creating new access to SR 92 at Whitesell St, and consolidating access for these two local roads.	$62,000	X	X	X	X	X		X
BA_052	Bay Area	Inter/Intra-state	04	ALA	262	SR 262 Mission Boulevard Cross Connector Improvements	This project will increase mobility between I-680 and I-880 by widening Mission to 3 lanes in each direction throughout the I-680 interchange, rebuild the NB and SB 680 on and off ramps, and potentially grade separate Mission Blvd. from Mohave Dr. and Warm Springs Blvd.	$112,000	X	X	X	X	X		
BA_053	Bay Area	Inter/Intra-state	04	ALA	580	I-580 Integrated Corridor Mobility (ICM)	This project implements multiple traffic operation systems and strategies that will address the challenges of traffic congestion in the corridor. The project will install new and upgrade existing corridor management elements along Interstate 580. Full ICM depends on extending North Canyons Parkway to Dublin Boulevard (RTPID 17-01-0048)	$146,000	X	X	X	X	X	X	X
BA_054	Bay Area	Inter/Intra-state	04	ALA	580	Santa Rita Road I-580 Overcrossing Widening	Widen Southbound Santa Rita Road overcrossing at I-580 constructing third southbound through lane at Pimlico Drive and second on ramp lane to I-580 eastbound.	$10,000	X	X	X	X	X		X
BA_055	Bay Area	Inter/Intra-state	04	ALA	580	I-580 Interchange Improvement at Hacienda/Fallon Road - Phase 2	1-580/Fallon Rd I/C Improvements (Phase 2): Reconstruct overcrossing to add lanes I-580 Hacienda Dr I/C Improvements: Reconstruct overcrossing to add lanes	$58,000	X	X	X	X	X		
BA_056	Bay Area	Inter/Intra-state	04	ALA	580	I-580 Greenville Road Interchange Improvements	Construct a new interchange at I-580/Greenville Road to replace the existing interchange. Project will include widening the undercrossing to provide six lanes, and constructing ramps to achieve a modified partial cloverleaf interchange design.	$68,000	X	X	X	X	X	X	X
BA_057	Bay Area	Inter/Intra-state	04	ALA	580	I-580 Vasco Road Interchange Improvements	Modify I-580/Vasco Rd interchange. Widen I-580 overcrossing and add new loop ramp in southwest quadrant. Includes widening Vasco Road to 8 lanes between Northfront Road and Las Positas Road and other local roadway improvements.	$81,000	X	X	X	X	X	X	X
BA_058	Bay Area	Inter/Intra-state	04	ALA	880	I-880 Winton Avenue Interchange Improvements	This project proposes to modify the existing Winton Avenue/I-880 cloverleaf interchange to a partial cloverleaf interchange, implement Complete Street per Caltrans HDM and provide direct access to Southland Mall.	$41,000	X	X	X	X	X		
BA_059	Bay Area	Inter/Intra-state	04	ALA	880	I-880 Whipple Road Interchange Improvements	Full interchange improvements at Whipple Road/I-880, including northbound off-ramp, surface street improvements and realignment	$80,000	X	X	X	X	X		X
BA_060	Bay Area	Inter/Intra-state	04	ALA	880	I-880 Broadway/Jackson Interchange Improvements	The project proposes to improve connectivity between I-880/I-980 and Alameda and Oakland. Improvements include reconfiguration of existing ramps, demolition of existing ones, and construction of new ramps.	$244,000	X	X	X	X	X	X	

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BA_061	Bay Area	Inter/Intra-state	04	ALA	880	I-880 Express Lanes: Northbound from Hegenberger to Lewelling and bridge improvements	I-880 Northbound express lane from Lewelling Blvd to Hegenberger Rd. and reconstruct bridges at Davis Street and Marina Boulevard - widen to add an express lane and reconstruct bridges	$221,000	X			X	X		X
BA_062	Bay Area	Inter/Intra-state	04	ALA	880	I-880 Industrial Parkway Interchange Reconstruction	Reconstruct the I-880/Industrial Parkway interchange to provide a northbound off-ramp and a southbound HOV bypass lane on the southbound loop off-ramp. Reconstruct the bridge over I-880.	$57,000	X	X	X	X	X	X	X
BA_063	Bay Area	Inter/Intra-state	04	ALA	880	I-880 to Mission Boulevard East-West Connector	Improved east-west connection between I-880 and Route 238 (Mission Blvd.) comprised of a combination of new roadways along preserved ROW and improvements to existing roadways and intersections along Decoto Road, Fremont Boulevard, Paseo Padre Parkway, Alvarado-Niles Road and Mission Boulevard.	$236,000	X	X	X	X	X		
BA_064	Bay Area	Inter/Intra-state	04	ALA	84 680	SR 84/I-680 Interchange Improvements and SR 84 Widening	Construct interchange improvements for the Route 84/I-680 Interchange, widen Route 84 from Pigeon Pass to I-680 and construct aux lanes on I-680 between Andrade and Route 84.	$278,000	X	X	X	X	X	X	X
BA_065	Bay Area	Inter/Intra-state	04	ALA	880/ 237	I-880 Express Lanes in both directions: Hegenberger/Lewelling to SR 237	Express lane on I-880 in Alameda County from Lewelling Blvd to SR 237 Direct Connector in northbound direction, Hegenberger Rd to SR 237 Direct Connector in the southbound direction- convert existing HOV lanes to express lanes.	$78,000	X	X	X	X			X
BA_066	Bay Area	Inter/Intra-state	04	ALA	OFF	Community Impact reduction through "receptor-side" mitigations - Invest in "receptor side" mitigations to reduce impacts on "fence-line" communities, including for example, planting trees or other pollution catchments between sources and communities, investing in improved air quality, air filtration, HVAC etc systems for sensitive facilities located near freight corridors.	Invest in "receptor side" mitigations to reduce impacts on "fence-line" communities, including for example, planting trees or other pollution catchments between sources and communities, investing in improved air quality, air filtration, HVAC etc systems for sensitive facilities located near freight corridors.	$10,000		X	X	X	X	X	X
BA_067	Bay Area	Inter/Intra-state	04	CC	4	SR 4 Integrated Corridor Mobility	SR 4 Integrated Corridor Mobility from I-80 to SR 160, including adaptive ramp metering, advanced traveler information, arterial management system, freeway management system, connected vehicle applications	$15,000	X	X	X	X	X	X	X
BA_068	Bay Area	Inter/Intra-state	04	CC	4	SR 4 Operational Improvements - Initial Phases	Various operational improvements on SR 4 between SR 242 and Bailey Road, including adding auxiliary lanes in strategic locations along this corridor	$144,000	X	X	X	X	X	X	X
BA_069	Bay Area	Inter/Intra-state	04	CC	80	Reconstruct I-80/San Pablo Dam Road Interchange	Phase 1 includes relocating El Portal Dr. on-ramp to WB I-80 to the north, extending the auxiliary lane along WB I-80 between San Pablo Dam Rd off-ramp and El Portal Dr on-ramp, and reconstructing the Riverside Ave pedestrian overcrossing. Phase 2 includes modifications to McBryde and SPDR I/C & Includes provisions for bicyclists and pedestrians on San Pablo Dam Rd.	$120,000	X	X	X	X	X	X	X
BA_070	Bay Area	Inter/Intra-state	04	CC	80	I-80/Central Avenue Interchange Modification - Phases 1 & 2	Construct new signals and changeable message signs to redirect I-80 westbound on-ramp traffic during weekend peak periods to I-580, connect Pierce Street to San Mateo Street to relocate the traffic signal at Pierce Street/Central Avenue to the San Mateo Street/Central Avenue intersection, and construct other necessary improvements.	$26,000	X	X	X	X	X	X	X
BA_071	Bay Area	Inter/Intra-state	04	CC	80	I-80 Eastbound and Westbound Pinole Valley Road On-ramp Improvement	Improve conditions for merging onto the I-80 mainline from the eastbound and westbound Pinole Valley Road on-ramps to address vehicles accelerating uphill after stopping at ramp meter.	$10,000	X	X	X	X	X	X	X
BA_072	Bay Area	Inter/Intra-state	04	CC	80	I-80/SR 4 Interchange Improvements - New Eastbound Willow Avenue Ramps	New SR 4 eastbound offramp and onramp at Willow north of Palm Avenue and removal of Willow Hook Ramps	$25,000	X	X	X	X	X	X	X

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BA_073	Bay Area	Inter/Intra-state	04	CC	680	I-680/SR 4 Interchange Improvements - Phases 1-3	Improve I-680/SR 4 interchange by implementing: direct connectors for NB I-680 to WB SR 4 (Ph1) & WB SR 4 to SB I-680 (Ph2), & widening SR 4 btw SR 242 & Morello from 2 to 3 lanes per direction (Ph3). The 2-lane direct connectors will replace a single lane loop ramp & a single lane diagonal ramp, respectively.	$292,000	X	X	X	X	X	X	X
BA_074	Bay Area	Inter/Intra-state	04	CC	OFF	Kirker Pass Road Northbound Truck Climbing Lane, Clearbrook Drive to Crest of Kirker Pass Road	This project will add NB truck climbing lane from Clearbrook Drive in the City of Concord to a point 1,000 beyond the crest of Kirker Pass Road. The addition will include a 12-foot dedicated truck climbing lane and a Class II bike lane within an 8-foot paved shoulder.	$19,000	X	X	X	X	X	X	X
BA_075	Bay Area	Inter/Intra-state	04	MRN	101	Implement Marin Sonoma Narrows HOV Lane and corridor improvements Phase 2 (Marin County)	Extend U.S. 101 HOV lane from Atherton Avenue to Marin/Sonoma County line in the northbound direction and from Rowland Boulevard to Marin/Sonoma County line in southbound direction. This project will complete the HOV lane system in Marin County from Richardson Bay Bridge to Marin/Sonoma County line.	$136,000	X	X	X	X			X
BA_076	Bay Area	Inter/Intra-state	04	MULT CO	80/ 580/ 880	I-80 Express Lanes: Westbound Bay Bridge Approaches	Express Lanes on the four westbound SFOBB bridge approaches: (1) I-80 direct connector from Powell Street to SFOBB metering lights (1.8 miles); (2) I-580 from I-80 junction to metering lights (1 mile); (3) I-880/880S direct connector from 14th Street to metering lights (1.5 miles); (4) West Grand Ave/I-880 direct connector to metering lights (0.7 miles) - convert existing HOV lanes to express lanes	$18,000	X	X	X	X			X
BA_077	Bay Area	Inter/Intra-state	04	MULT CO	OFF	Climate Program: TDM and Emission Reduction Technology - MTC Climate Initiatives Program includes transportation demand management (TDM) strategies, car sharing, vanpool incentives, alternative fuel/vehicle initiatives, targeted transportation alternatives, trip caps and commuter benefits ordinances.	Climate Program: TDM and Emission Reduction Technology - MTC Climate Initiatives Program includes transportation demand management (TDM) strategies, car sharing, vanpool incentives, alternative fuel/vehicle initiatives, targeted transportation alternatives, trip caps and commuter benefits ordinances.	$535,000	X	X	X	X	X	X	

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BA_078	Bay Area	Inter/Intra-state	04	MULT CO	OFF	Bay Area Forward - This program includes a variety of operational and multimodal improvements, including: active traffic management - upgrades to all existing ramp meters to adaptive, implementing hard shoulder running lanes, contra-flow lanes, queue warning, and ramp modifications; arterial operations - implementation of traditional time-of-day signal timing coordination, adaptive traffic signal control systems, transit signal priority, real-time traffic monitoring devices, ped/bike detection, queue-jump lanes, etc; connected vehicles - pilot deployments of vehicle-to-infrastructure (V2I) strategies; Managed Lanes Implementation Plan - pilot express bus service for routes not currently served by operators; expands park-and-ride facilities throughout the region; and supports pilot deployment of shared-mobility solutions.	Bay Area Forward - This program includes a variety of operational and multimodal improvements, including: active traffic management - upgrades to all existing ramp meters to adaptive, implementing hard shoulder running lanes, contra-flow lanes, queue warning, and ramp modifications; arterial operations - implementation of traditional time-of-day signal timing coordination, adaptive traffic signal control systems, transit signal priority, real-time traffic monitoring devices, ped/bike detection, queue-jump lanes, etc; connected vehicles - pilot deployments of vehicle-to-infrastructure (V2I) strategies; Managed Lanes Implementation Plan - pilot express bus service for routes not currently served by operators; expands park-and-ride facilities throughout the region; and supports pilot deployment of shared-mobility solutions.	$995,000	X	X	X	X	X	X	X
BA_079	Bay Area	Inter/Intra-state	04	MULT CO	OFF	Regional Transportation Emergency Management Program - This program enhances first responders capabilities to clear traffic incidents and respond to major emergencies through integrated corridor management.	Regional Transportation Emergency Management Program - This program enhances first responders capabilities to clear traffic incidents and respond to major emergencies through integrated corridor management.	$25,000	X					X	X
BA_080	Bay Area	Inter/Intra-state	04	MULT CO	OFF	MTC Express Lane Program Cost	Includes non-corridor activities such as centralized toll system activities, start-up program management, contingency and capitalized O&M.	$113,000	X	X	X	X			X
BA_081	Bay Area	Inter/Intra-state	04	MULT CO	VAR	Goods Movement Clean Fuels and Impact Reduction Program - Program for implementing recommendations of the Freight Emission Reduction Action Plan and developing programs for impact reduction in neighborhoods with high levels of freight activity.	Goods Movement Clean Fuels and Impact Reduction Program - Program for implementing recommendations of the Freight Emission Reduction Action Plan and developing programs for impact reduction in neighborhoods with high levels of freight activity.	$350,000	X	X	X	X	X	X	X
BA_082	Bay Area	Inter/Intra-state	04	NAP	29	SR 29 Gateway	Construct SR 29 to 6-lanes for cars and improved conditions for other travel modes from American Canyon Road to Napa Junction Road	$32,000	X	X	X	X	X		X
BA_083	Bay Area	Inter/Intra-state	04	NAP	29/ 221	Soscol Junction	Improvements at SR 29/SR 221/ Soscol Ferry Road.	$61,000	X	X	X	X	X		X

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BA_084	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101 Southbound/Trimble Rd./De La Cruz Blvd./Central Expressway Interchange Improvements	Improve interchange at U.S. 101 southbound Trimble Road/De la Cruz Boulevard/Central Expressway.	$53,000	X	X	X	X	X		X
BA_085	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101/Blossom Hill Rd. Interchange Improvements	Widen interchange at U.S. 101/Blossom Hill Road.	$28,000	X	X	X	X	X		X
BA_086	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101/Old Oakland Rd. Interchange Improvements	Improve interchange at U.S. 101/Old Oakland Road.	$28,000	X	X	X	X	X		X
BA_087	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101 Interchanges Improvements: San Antonio Rd. to Charleston Rd./Rengstorff Ave.	Improve U.S. 101 interchanges at San Antonio Road to Charleston Road/Rengstorff Avenue including new auxiliary lane.	$40,000	X	X	X	X	X		X
BA_088	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101/Zanker Rd./SkyPort Dr./Fourth St. Interchange Improvements	Construct a new interchange at U.S. 101/Zanker Road/SkyPort Drive/Fourth Street	$161,000	X	X	X	X	X		X
BA_089	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101/Mabury Rd./Taylor St. Interchange Improvements	Construct interchange at U.S. 101/Mabury Road/Taylor Street	$82,000	X	X	X	X	X		X
BA_090	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101/Shoreline Blvd. Interchange Improvements	Interchange improvements at Shoreline Boulevard.	$20,000	X	X	X	X	X		X
BA_091	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101 Express Lanes: Whipple Ave. in San Mateo County to Cochrane Road in Morgan Hill	Convert HOV Lanes to express lane and add a second express lane in some segments.	$507,000	X	X	X	X			X
BA_092	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101 Corridor - Includes: U.S. 101 Widening to 6 lanes	U.S. 101 Corridor - Includes: U.S. 101 Widening to 6 lanes	$460,000	X	X			X		X
BA_093	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101/Buena Vista Ave. Interchange Improvements	Construct a full interchange at U.S. 101 and Buena Vista Avenue in Gilroy. The interchange includes a flyover southbound on-ramp to braid with the existing truck exit at the CHP Inspection Station. Off-ramp diagonal ramps will be constructed.	$40,000	X	X	X	X	X		X
BA_094	Bay Area	Inter/Intra-state	04	SCL	101	U.S. 101/SR 25 Interchange Project - Phase 1	The project consists of reconfiguring the interchange at U.S. 101 and SR 25 just south of the City of Gilroy in Santa Clara County, connecting SR 25 and Santa Teresa Boulevard, and widening the existing freeway from 4 to 6 lanes from the Monterey Street interchange to the U.S. 101/SR 25 interchange.	$203,000	X	X	X	X	X	X	X
BA_095	Bay Area	Inter/Intra-state	04	SCL	880	I-880 Express Lanes: SR 237 to U.S. 101	Convert existing HOV lane to an express lane in both directions between SR 237 and U.S. 101	$28,000	X	X	X	X	X		X
BA_096	Bay Area	Inter/Intra-state	04	SCL	OFF	Multimodal Streetscape in Santa Clara county	Projects in this category implement multimodal or complete streets elements throughout Santa Clara County including but not limited to Los Gatos Boulevard, Monterey Road, Shoreline Boulevard, Stevens Creek Road, Downtown Sunnyvale Complete Streets, Wedgewood Avenue, West San Carlos, and Winchester Boulevard. This category also includes intersection improvements for non-expressways in Santa Clara County.	$446,000	X	X		X	X		X
BA_097	Bay Area	Inter/Intra-state	04	SF	101/ 280	HOV/HOT Lanes on U.S. 101 and I-280 in San Francisco	Phase 1 (full implementation): Convert an existing mixed traffic lane and/or shoulder/excess ROW in each direction to HOV 3+ lanes on U.S. 101 from SF/SM County line to I-280 interchange and on I-280 from U.S. 101 interchange to 6th Street off ramp to enhance carpool and transit operations during peak periods.	$43,000	X	X	X	X			X
BA_098	Bay Area	Inter/Intra-state	04	SM	101	Improve U.S. 101/Woodside Road interchange	Modifies the Woodside Road Interchange at U.S. 101.	$171,000	X	X	X	X		X	X

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BA_099	Bay Area	Inter/Intra-state	04	SM	101	Improve operations at U.S. 101 near Route 92 - Phased	U.S. 101 operational improvements near Route 92. Project may have phased construction.	$258,000	X	X	X	X		X	X
BA_100	Bay Area	Inter/Intra-state	04	SM	101	Add northbound and southbound modified auxiliary lanes and/ or implementation of managed lanes on U.S. 101 from I-380 to SF County line	Add northbound and southbound modified auxiliary lanes and/ or implementation of managed lanes on U.S. 101 from I-380 to SF County line	$222,000	X	X		X	X		
BA_101	Bay Area	Inter/Intra-state	04	SM	101	U.S. 101 Interchange at Peninsula Avenue	Construct southbound on and off ramps to U.S. 101 at Peninsula Ave to add on and off ramps from southbound 101.	$89,000	X	X	X	X	X		X
BA_102	Bay Area	Inter/Intra-state	04	SM	101	U.S. 101 Produce Avenue Interchange	Construct a new interchange on U.S. 101 at Produce Avenue, connecting Utah Avenue on the east side of U.S. 101 to San Mateo Avenue on the west side of U.S. 101. This will allow for reconfiguration of the existing southbound ramps at Produce Ave and AirPort Blvd, as well incorporation of the northbound off- and on- ramps at S. AirPort Blvd into the interchange design.	$146,000	X	X	X	X	X	X	X
BA_103	Bay Area	Inter/Intra-state	04	SM	82/ OFF	Multimodal Streetscape	Projects in this category implement multimodal or complete streets elements, including but not limited to projects such as Grimmer Boulevard Greenway, Telegraph Avenue Complete Streets, West Grand Avenue Complete Streets, Hearst Avenue Complete Streets	$289,000	X			X	X		X
BA_104	Bay Area	Inter/Intra-state	04	SOL	80	I-80 Express Lanes in both directions: Carquinez Bridge to Bay Bridge	Express Lanes on westbound I-80 from Carquinez Bridge Toll Plaza to Powell St Direct Connector on eastbound I-80 from Powell St Direct Connector to Cummings Skyway. Add new express lane on eastbound I-80 from Cummings Skyway to Carquinez Bridge.	$81,000	X	X	X	X			X
BA_105	Bay Area	Inter/Intra-state	04	SOL	80	I-80 WB Truck Scales	Project upgrades existing truck scales on WB I-80 in Solano County. Existing westbound truck scales are located on the most congested freeway segment of I-80 in Solano County. Scales are outdated and cannot process the current and future truck volumes on WB I-80. Trucks are slow to enter and leave the scales because of short ramps, adding to existing traffic congestion and safety issues on I-80.	$170,000	X	X	X	X	X	X	X
BA_106	Bay Area	Inter/Intra-state	04	SOL	80	I-80 Express Lanes in both directions: Airbase Parkway to Red Top Road	Express Lanes on I-80 in Solano County from Red Top Road to Air Base Parkway - convert existing HOV lanes to express lanes	$44,000	X	X	X	X			X
BA_107	Bay Area	Inter/Intra-state	04	SOL	80	I-80 Express Lanes in both directions: Airbase Parkway to I-505	I-80 Solano Express Lanes from Air Base to I-505-widen to add an express lane in each direction	$136,000	X	X	X	X			X
BA_108	Bay Area	Inter/Intra-state	04	SOL	80	I-80/I-680/SR 12 Interchange (Packages 2-7)	Packages 2-7 provide direct connectivity from I-680 NB to SR 12 WB, widens I-680 and I-80 near the interchange, and improves connections to Red Top road off-ramp. Express lane direct connectors are included in RTPID 17-10-0061.	$380,000	X	X	X	X	X	X	X
BA_109	Bay Area	Inter/Intra-state	04	SON	101	Hearn Avenue Interchange	The project would replace the existing Hearn Avenue overcrossing bridge with a new bridge to accommodate four traffic lanes with bike lanes and sidewalks on both sides of the roadway. The project would also increase the bridge height clearance and improve ramp connections to U.S. 101 and provide continuous bike lanes and sidewalks between Corby Avenue and Santa Rosa Avenue	$36,000	X	X	X	X	X	X	X
BA_110	Bay Area	Inter/Intra-state	04	SON	101	Arata Lane Interchange	Construction of the Northbound on-ramp to U.S. 101 will complete the Arata Lane interchange with U.S. 101. This project also includes the relocation of a Portion of Los Amigos Road north of Arata Lane. Rights of way have been obtained in prior phases.	$4,000	X	X	X	X	X	X	X
CC_111	Central Coast	Rail Systems	05	SB	OFF	UP Rail Bridge Replacement and Cabrillo Boulevard Bike/Ped Improvements	Replacement of the UPRR bridge at Cabrillo Blvd for improved operations and coastal access for peds and bikes	$25,000	X		X	X	X	X	X
CC_112	Central Coast	Rail Systems	05	SCR	OFF	Santa Cruz Branch Line Freight Service Upgrades	Upgrade rail line to FRA Class 2 to a condition for reasonable ongoing maintenance into the future. Upgrade crossings, replace jointed rail with continuously welded rail, upgrade signals, and replace ties	$25,000	X	X			X	X	X

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									Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
CC_113	Central Coast	Rail Systems	05	SCR	OFF	Santa Cruz County Regional Transportation Commission (SCCRTC) Railroad Infrastructure Maintenance and Rehabilitation	Protect, maintain and rehabilitate the railroad infrastructure on the Santa Cruz Branch Rail Line including bridges, track, drainage, culverts, signals, etc.	$22,410	X				X	X	X
CC_114	Central Coast	Rail Systems	05	SLO	OFF	Santa Maria Valley Railroad San Luis Obispo Rail Yard Facility	Rebuild San Luis Obispo Rail Yard Facility; new track	$3,479	X				X		X
CC_115	Central Coast	Rail Systems	05	SLO	OFF	Cuesta second main track	Add second track on north side of Cuesta Ridge to accommodate a second main rail line	$165,000	X		X	X			X
CC_116	Central Coast	Rail Systems	05	SLO	OFF	UP Rail Tunnel Notching	Tunnel notching for Coast Subdivision tunnels on the Cuesta Grade tunnels (San Luis Obispo Co) and at Chatsworth (Ventura County) to allow for Union Pacific intermodal freight train movements providing operational flexibility and reliability on their network in California.	TBD	X				X		X
CC_117	Central Coast	Rail Systems	05	SLO	OFF	UP main line Centralized Traffic Control (PM 245-276)	Centralized Traffic Control (PM 245-276). Wellsona to Paso Robles curve realignments	$94,000					X	X	
CC_118	Central Coast	Rail Systems	05	SLO	OFF	UP main line Centralized Traffic Control (PM 205-230)	Centralized Traffic Control (PM 205-230).	$25,000					X	X	
CC_119	Central Coast	Rail Systems	05	SLO	OFF	Fix low clearance issue for large freight trucks at overpasses. Some railroad and highway overpasses create low clearance hazards for wide/heavy loads	Fix low clearance issue for large freight trucks at overpasses. Some railroad and highway overpasses create low clearance hazards for wide/heavy loads	$15,000					X	X	
CC_120	Central Coast	Rail Systems	05	SLO	OFF	Henry to Santa Margarita curve realignments	Henry to Santa Margarita curve realignments	$45,000	X				X		X
CC_121	Central Coast	Rail Systems	05	SLO	OFF	Rail siding extension (Templeton) Templeton to Henry curve alignments	Rail siding extension (Templeton) Templeton to Henry curve alignments	$107,000	X				X		X
CC_122	Central Coast	Rail Systems	05	SLO	OFF	Rail siding extension (Wellsona)	New Wellsona siding (MP 206.6)	$21,000	X				X	X	
CC_123	Central Coast	Rail Systems	05	SLO	OFF	Install power switches (McKay East) and McKay to Wellsona curve realignments	Install power switches (McKay East) and McKay to Wellsona curve realignments	$15,000	X				X		X
CC_124	Central Coast	Inter/Intra-state	05	MON	156	SR 156 West Corridor Project - Castroville Blvd Interchange	Install new interchange to convert SR 156 from two-lane conventional highway to four-lane expressway, and improve safety and operations. This segment is an important connector to the Monterey Peninsula between SR 1 and U.S. 101. In addition to agricultural truck traffic, it serves local, commuter, and recreational traffic. The new interchange will remove two existing at-grade full intersections (Castroville Blvd and Monte Del Lago). It will accomodate the future extension of Blackie Road, which will provide for direct connection between the major freight agricultural hub in southern Castroville, allowing trucks to bypass neighborhoods and main streets.	$48,000	X	X		X	X	X	X

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CC_125	Central Coast	Inter/Intra-state	05	SB	101	South Coast U.S. 101 HOV Lanes (Phases 4D and 4E)	Add one HOV lane in each direction on U.S. 101 between the cities of Carpinteria and Santa Barbara. It will provide long-life 40-year pavement on all lanes. This project is located on a critical portion of U.S. 101 which serves high volumes of interregional travelers and freight carriers. The project will reduce delay by over 13,500 passenger hours per day and is part of a larger multimodal transportation solution that integrates highway improvements with regional transit (rail and bus) service expansion. This project will improve reliability for all vehicles, including freight, and will encourage a modal shift to other forms of transportation. Completion of this project will substantially improve goods movement, interregional travel, and nationwide commerce by improving reliability and safety on U.S. 101. U.S. 101 is critical for interregional travel and goods movement between the San Francisco Bay Area and the Los Angeles basin. It supports the region's agricultural industry, responsible for over $10 billion and 23 million tons of goods each year. U.S. 101 serves a strategic role in national defense and the energy production sector.	$192,980	X	X	X	X	X	X	X
CC_126	Central Coast	Inter/Intra-state	05	SB	101	San Ysidro Interchange in Montecito/(SB-101-10.02)	Install roundabout at U.S. 101 on- and off-ramps at San Ysidro Rd/Jameson to improve operations. There is an existing bottleneck at northbound U.S. 101 and San Ysidro Road that produces close to 6,000 hours of annual delay. This bottleneck typically lasts close to one hour, and appears approximately 50 days per year. Project will accommodate trucks and will reduce idling time spent by trucks serving businesses along local roads. It will provide improved active transportation mobility and connectivity.	$10,000	X		X	X	X		X
CC_127	Central Coast	Inter/Intra-state	05	SBT	25	SR 25 Expressway Conversion Phase 1	Convert SR 25 from a two-lane undivided conventional highway to a four-lane expressway expressway from Hollister to SR 156. The conversion would improve operation and safety through reduction of at-grade turning movements and driveway openings, improving the primary connection between Hollister and Santa Clara County for agricultural traffic as well as local, regional, and interregional passenger traffic.	$62,000	X	X	X		X		X
CC_128	Central Coast	Inter/Intra-state	05	SCR	1	Santa Cruz Highway 1 HOV/ (SCR-1-7.672/15.822)	The HOV Lane project would expand the existing four-lane highway to a six-lane facility by adding one HOV lane in each direction next to the median and auxiliary lanes on the outside in each direction. The project is anticipated to reduce recurrent congestion on SR 1, which experiences several bottlenecks in the southbound and northbound directions. Travel time delays due to congestion are experienced by commuters, transit users, commerce, and emergency vehicles. It will also promote the use of alternative transportation modes as means to increase system capacity, encourage carpooling and ridesharing, and improve safety. Improving conditions on SR 1 would reduce cut-through traffic on local streets. The HOV project would include multiple bike/ped overcrossings to expand the opportunities for active users to safely cross SR 1.	$61,980	X	X		X	X	X	X

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									Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
CC_129	Central Coast	Inter/Intra-state	05	SCR	1	Santa Cruz Hwy 1 Aux Lanes- State Park - Bay/Porter (SCR-1- 12.088/13.192)	The project will construct northbound and southbound auxiliary lanes between the Bay Avenue/Porter Street and State Park Drive interchanges and replace the existing Capitola Avenue local roadway overcrossing. This section of Highway 1 is one of the busiest in the county, providing access to the City of Capitola, Soquel and Aptos villages, and Cabrillo College. The auxiliary lanes will connect the on-ramps with the next off-ramp, thereby extending the weaving and merging distance between the ramps, improving traffic operations, and reducing cutthrough traffic diverting to local streets and neighborhoods. The new Capitola Avenue overcrossing will include enhanced bicycle and pedestrian facilities to improve connectivity for bicyclists and pedestrians between Soquel Drive to the north and the future Coastal Rail Trail to the south. The overcrossing, soundwalls and retaining walls will incorporate aesthetic treatments consistent with the visual character of the corridor and the adjacent community.	$73,000	X	X		X	X		X
CC_130	Central Coast	Inter/Intra-state	05	SCR	OFF	Santa Cruz Hwy 1 Aux Lanes - 41st-Soquel Segment	The Highway 1 41st/Soquel Auxiliary Lanes Project extends approximately 1.4 miles along Highway 1 between 41st Avenue in Capitola and Soquel Drive in Live Oak. The project proposes to add northbound and southbound auxiliary lanes between the two interchanges and to construct a new bicycle and pedestrian overcrossing at Chanticleer Avenue. Historically, this section of Highway 1 has been the busiest in the county serving over 100,000 vehicles a day, facilitating connection for agricultural traffic generating in Watsonville. It will help provide access to the primary regional commercial/retail activity centers on 41st Avenue and regional medical facilities located on Soquel Drive. The auxiliary lanes will connect the on-ramps with the next off-ramp, thereby extending the weaving and merging distance between the ramps, improving traffic operations, and reducing cutthrough traffic diverting to local streets and neighborhoods. The project is being designed to be compatable with a proposed Bus on Shoulder operation.	$32,100	X	X		X	X	X	X
CC_131	Central Coast	Inter/Intra-state	05	SLO	41	SR 41 North of Wye Truck Climbing Lane/ (SLO-41-47.90 / 48.0)	Build truck climbing lane to facilitate tractor-trailer and other slow-vehicle passing maneuvers	$22,976	X	X	X	X	X	X	

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CC_132	Central Coast	Inter/Intra-state	05	SLO	46	SR 46E Antelope Grade	This project will convert a two-lane conventional highway into a four-lane divided expressway. This project will improve congestion, enhance safety and provide passing opportunities, reduce driver frustration, improve the facilitation of goods movement, improve recreational travel and major east/west route from the San Joaquin Valley and Interstate 5 to the Central Coast and U.S. 101. Heavy trucks and RV's comprise a very high percentage of the total traffic on this portion of Route 46. These vehicles typically experience a reduction in running speed of 31 km/h. There are limited passing opportunities on this segment, which contributes to driver frustration and passing miscalculations. Traffic volumes are expected to grow at a rate that is correspondingly higher than local population growth predictions. Growth in traffic volumes here will instead reflect the State of California growth rate overall, and traffic volumes on Route 46 will climb proportionally. Route 46 will continue to serve as a vital conduit for traffic to and from the San Joaquin Valley region and beyond to the Central Coast.	$97,500	X	X	X		X	X	X
CC_133	Central Coast	Inter/Intra-state	05	SLO	46	SR 46E /Union Rd. improvements	New interchange/overcrossing	$37,750	X				X		
CC_134	Central Coast	Inter/Intra-state	05	SLO	46	Highway 46 Wye Segment	Convert two-lane conventional highway to four-lane expressway and construct grade-separated interchange at the junction of SR 46 and SR 41. This project would enhance safety, improve operations, improve the facilitation of goods movement, improve recreational travel using the major east/west routes from the San Joaquin Valley and Interstate 5 to the Central Coast and U.S. 101. Heavy trucks and RV's comprise a very high percentage of the total traffic on this portion of Route 46/41 Wye intersection. This project would construct improvements at the Wye to eliminate the conflict point with the heavy traffic left-turning cross movements from eastbound Highway 46 onto northbound Highway 41 with a grade separation. The project realigns the existing two-lane configuration and allows for the eventual completion of the four-lane divided expressway Vehicles typically experience a reduction in running speed of 31 km/h. There are limited passing opportunities on this corridor, which contributes to driver frustration and passing miscalculations. Traffic volumes are expected to grow at a rate that is correspondingly higher than local population growth projections. Growth in traffic volumes here will instead reflect the State of California growth rate overall, and traffic volumes on Route 46 will climb proportionally. Route 46/41 will continue to serve as a vital conduit for traffic to and from the San Joaquin Valley region and beyond, through the Temblor Mountain Range, to the Central Coast.	$92,742	X	X	X		X	X	X
CS_135	Central Sierra	Inter/Intra-state	09	INY	395	Olancha / Cartago - Construct Four-Lane	Convert 2-lane conventional highway to a four-lane expressway on US 395 in Inyo County to improve safety, improve multimodal access through shoulder widening, build/improve drainage and wildlife crossing structures, improve rural community lifeline access, improve freight access and goods movement.	$137,900		X	X		X		X
CS_136	Central Sierra	Inter/Intra-state	10	CAL	4	Wagon Trail Expressway on new alignment (Wagon Trail Realignment)	Wagon Trail Expressway on new alignment (Wagon Trail Realignment)	$71,458	X	X		X	X	X	X
CS_137	Central Sierra	Inter/Intra-state	10	MPA	49	Old Highway Bridge Right of Way Obtainment	Old Highway Bridge Right of Way Obtainment	$4,100	X	X		X		X	X

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									Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
CS_138	Central Sierra	Inter/Intra-state	10	MPA	140	Install Passing Lanes	Install Passing Lanes	$2,900	X			X	X		X
CS_139	Central Sierra	Inter/Intra-state	10	TUO	108	Peaceful Oak Ramps	Peaceful Oak Ramps	$6,497	X	X		X	X	X	
CS_140	Central Sierra	Inter/Intra-state	10	TUO	120	Install traffic signal and geometric improvements ; In Tuolumne County at SR 120/108 Yosemite Junction -- Cost TBD	Install traffic signal and geometric improvements ; In Tuolumne County at SR 120/108 Yosemite Junction	$2,450	X	X		X	X	X	X
CV_141	Central Valley	Rail Systems	03	PLA	80	On the Union Pacific mainline, from near the Sacramento and Placer County boarder to the Roseville Station area in Placer County: Construct a layover facility, install various Union Pacific Railroad Yard track improvements, required signaling, and construct the most northern eight miles of third mainline track between Sacramento and Roseville (largely all in Placer County), which will allow up to two additional round trips (for a total of three round trips) between Sacramento and Roseville (Phase 1) (CAL18320)	On the Union Pacific mainline, from near the Sacramento and Placer County boarder to the Roseville Station area in Placer County: Construct a layover facility, install various Union Pacific Railroad Yard track improvements, required signaling, and construct the most northern eight miles of third mainline track between Sacramento and Roseville (largely all in Placer County), which will allow up to two additional round trips (for a total of three round trips) between Sacramento and Roseville (Phase 1) (CAL18320)	$83,535	X	X	X	X	X	X	X
CV_142	Central Valley	Rail Systems	03	PLA	OFF	Capitol Corridor Third Track - Phase One	On the UP mainline, from Elvas Tower in Sacramento County to Roseville Station in Placer County: Construct third track. Project involves: extension of freight lead track; construction of track and signal improvements; construction of satellite maintenance facility and other associated improvements; and possible relocation of the Roseville rail station to address conflicting train movements that affect capacity. Project improvements will permit service capacity increases for Capitol Corridor in Placer County, with up to ten round trips to Roseville.	$224,000	X	X	X	X	X	X	X
CV_143	Central Valley	Rail Systems	03	SAC	OFF	At Watt Ave and UPRR crossing, replace or rebuild existing railroad bridge to extend structure with a longer span to create more horizontal clearance above Watt Ave. Construct new adjacent span with a third railroad track. Watt Ave from Roseville Road to Peacekeeper Way, widen to accommodate buffered bicycle lanes and pedestrian facilities. Watt at Roseville Road and at Peacekeeper Way, modify signals for bicycle lanes. Also modify existing storm water pump station (SAC25260)	At Watt Ave and UPRR crossing, replace or rebuild existing railroad bridge to extend structure with a longer span to create more horizontal clearance above Watt Ave. Construct new adjacent span with a third railroad track. Watt Ave from Roseville Road to Peacekeeper Way, widen to accommodate buffered bicycle lanes and pedestrian facilities. Watt at Roseville Road and at Peacekeeper Way, modify signals for bicycle lanes. Also modify existing storm water pump station (SAC25260)	$80,000	X	X	X	X	X	X	X

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CV_144	Central Valley	Rail Systems	03	YOL	OFF	Design, environmental clearance, and permitting of the Yolo Rail Realignment Project, Phase 2A (YOL19288)	Design, environmental clearance, and permitting of the Yolo Rail Realignment Project, Phase 2A (YOL19288)	$10,500	X	X	X	X	X	X	X
CV_145	Central Valley	Grade Separations	03	PLA	OFF	In the City of Roseville, construct 4 lane bridge over UPRR tracks and Industrial Ave on westbound Blue Oaks Blvd between Foothills Blvd and Washington Blvd to widen existing 4 lane roadway to 8 lanes (PLA25752)	In the City of Roseville, construct 4 lane bridge over UPRR tracks and Industrial Ave on westbound Blue Oaks Blvd between Foothills Blvd and Washington Blvd to widen existing 4 lane roadway to 8 lanes (PLA25752)	$23,000	X	X			X	X	X
CV_146	Central Valley	Grade Separations	10	SJ	OFF	Stockton Diamond Grade Separation Project	Stockton Diamond Grade Separation Project – Grade separation (like Colton Crossing) to untangle BNSF, UP, San Joaquin's and ACE trains at the existing at-grade Stockton Diamond	$200,000	X	X		X	X	X	X
CV_147	Central Valley	Inter/Intra-state	03	ED	50	At the intersection of Camino Heights Drive and Vista Terra Drive, roadway widening, construct a roundabout, upgrade drainage facilities. Near Placerville and Camino, from 0.1 miles west of Still Meadows Road to 0.1 mile east of Upper Carson Road, construct concrete median barrier, widen outside shoulders, and add acceleration/deceleration lanes at local road connection (PM R22.0 to 24.3) and/or associated operational and safety improvements on and adjacent to U.S. 50. Construct mainline undercrossing (PM 23.48) to allow extension of Ponderado Road eastward to connect with Carson Road on the north side of U.S. 50 (CAL18190)	At the intersection of Camino Heights Drive and Vista Terra Drive, roadway widening, construct a roundabout, upgrade drainage facilities. Near Placerville and Camino, from 0.1 miles west of Still Meadows Road to 0.1 mile east of Upper Carson Road, construct concrete median barrier, widen outside shoulders, and add acceleration/deceleration lanes at local road connection (PM R22.0 to 24.3) and/or associated operational and safety improvements on and adjacent to U.S. 50. Construct mainline undercrossing (PM 23.48) to allow extension of Ponderado Road eastward to connect with Carson Road on the north side of U.S. 50 (CAL18190)	$50,270	X	X		X	X	X	X
CV_148	Central Valley	Inter/Intra-state	03	PLA	65	SR 65 Capacity & Operational Improvements Phase 2	SR 65, from Galleria Blvd. to Lincoln Blvd., make capacity and operational improvements. Phase 2: From Galleria Blvd. to Blue Oaks Blvd., widen from 5 to 7 lanes with 1 carpool lane southbound and 1 general purpose lane northbound, and construct auxiliary lanes from Galleria Blvd. to Pleasant Grove Blvd on northbound and southbound SR 65, including widening Galleria Blvd. southbound off-ramp, Pleasant Grove Blvd. southbound on-ramp, and Blue Oaks Blvd. southbound on-ramps and northbound on-ramp.	$35,250	X	X			X	X	X
CV_149	Central Valley	Inter/Intra-state	03	PLA	65	In Placer County on Sunset Blvd, widen from State Route 65 to Cincinnati Ave from 2 to 6 lanes. Project includes widening Industrial Blvd/UPRR overcrossing from 2 to 6 lanes (PLA25044)	In Placer County on Sunset Blvd, widen from State Route 65 to Cincinnati Ave from 2 to 6 lanes. Project includes widening Industrial Blvd/UPRR overcrossing from 2 to 6 lanes (PLA25044)	$37,500	X	X	X	X	X	X	X

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CV_150	Central Valley	Inter/Intra-state	03	PLA	80	In Roseville and Rocklin: Between SR 65 and Rocklin Rd. on eastbound I-80, and east of Douglas Blvd. to west of Riverside Ave. on westbound I-80; Construct eastbound I-80 auxiliary lane, including two-lane off-ramp to Rocklin Rd, and construct 5th lane on westbound I-80, including reducing Douglas Boulevard off-ramp from 2-lanes to 1-lane. (PLA25576)	In Roseville and Rocklin: Between SR 65 and Rocklin Rd. on eastbound I-80, and east of Douglas Blvd. to west of Riverside Ave. on westbound I-80; Construct eastbound I-80 auxiliary lane, including two-lane off-ramp to Rocklin Rd, and construct 5th lane on westbound I-80, including reducing Douglas Boulevard off-ramp from 2-lanes to 1-lane. (PLA25576)	$18,655	X	X		X	X	X	X
CV_151	Central Valley	Inter/Intra-state	03	PLA	80 65	In Placer County: Between Douglas Blvd. and Rocklin Road; Reconfigure I-80/SR 65 interchange to widen southbound to eastbound ramp from 1 to 2 lanes, replace existing eastbound to northbound loop ramp with a new 3 lane direct flyover ramp (including full middle structure for East Roseville Viaduct), construct collector-distributor roadway parallel to eastbound I-80 between Eureka Road off-ramp and SR 65, and widen Taylor Road from 2 to 4 lanes between Roseville Parkway and Pacific Street (PLA25649)	In Placer County: Between Douglas Blvd. and Rocklin Road; Reconfigure I-80/SR 65 interchange to widen southbound to eastbound ramp from 1 to 2 lanes, replace existing eastbound to northbound loop ramp with a new 3 lane direct flyover ramp (including full middle structure for East Roseville Viaduct), construct collector-distributor roadway parallel to eastbound I-80 between Eureka Road off-ramp and SR 65, and widen Taylor Road from 2 to 4 lanes between Roseville Parkway and Pacific Street (PLA25649)	$250,000	X	X		X	X	X	X
CV_152	Central Valley	Inter/Intra-state	03	PLA	OFF	In Placer County, Baseline Rd from Watt Ave to future 16th Street, widen from 2 to 4 lanes (Phase 1, West Portion) (PLA15105)	In Placer County, Baseline Rd from Watt Ave to future 16th Street, widen from 2 to 4 lanes (Phase 1, West Portion) (PLA15105)	$19,200	X	X		X	X	X	X
CV_153	Central Valley	Inter/Intra-state	03	PLA	OFF	In Placer County, Baseline Road from Sutter County to Future 16th St, widen from 2 to 4 lanes (Baseline Road Widening Phase 2, West Portion) (PLA25463)	In Placer County, Baseline Road from Sutter County to Future 16th St, widen from 2 to 4 lanes (Baseline Road Widening Phase 2, West Portion) (PLA25463)	$29,000	X	X		X	X	X	X

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CV_154	Central Valley	Inter/Intra-state	03	PLA	OFF	In Placer County between SR 65 and Foothills Blvd, construct phase 1 of Placer Parkway, including upgrading the SR 65/Whitney Ranch Parkway interchange to include a southbound slip off-ramp, southboud loop on-ramp, northbound loop on-ramp, six-lane bridge over SR 65, and four-lane roadway extension from SR 65 (Whitney Ranch Parkway) to Foothills Blvd (PLA25299)	In Placer County between SR 65 and Foothills Blvd, construct phase 1 of Placer Parkway, including upgrading the SR 65/Whitney Ranch Parkway interchange to include a southbound slip off-ramp, southboud loop on-ramp, northbound loop on-ramp, six-lane bridge over SR 65, and four-lane roadway extension from SR 65 (Whitney Ranch Parkway) to Foothills Blvd (PLA25299)	$70,000	X	X		X	X	X	X
CV_155	Central Valley	Inter/Intra-state	03	PLA	OFF	In the City of Roseville, north of Pleasant Grove Blvd and south of Blue Oaks Blvd, construct roadway segment between Foothills Blvd and Washington Blvd, extending Roseville Parkway from it's current termination point at Washington Blvd, through to Foothills Blvd. The segment will include a bridge over Industrial Blvd and the UPRR tracks (PLA25711)	In the City of Roseville, north of Pleasant Grove Blvd and south of Blue Oaks Blvd, construct roadway segment between Foothills Blvd and Washington Blvd, extending Roseville Parkway from it's current termination point at Washington Blvd, through to Foothills Blvd. The segment will include a bridge over Industrial Blvd and the UPRR tracks (PLA25711)	$22,500	X	X		X	X	X	X
CV_156	Central Valley	Inter/Intra-state	03	PLA	OFF	In Roseville, widen Washington Blvd from 2 to 4 lanes, including widening the Andora Underpass under the UPRR tracks, between Sawtell Rd and just south of Pleasant Grove Blvd. and construct bicycle and pedestrian improvements adjacent to roadway. (CMAQ funds are for bicycle and pedestrian improvements only. Emission Benefits in kg/day: 0.9 ROG, 0.51 NOx, 0.16 PM10) (PLA25501)	In Roseville, widen Washington Blvd from 2 to 4 lanes, including widening the Andora Underpass under the UPRR tracks, between Sawtell Rd and just south of Pleasant Grove Blvd. and construct bicycle and pedestrian improvements adjacent to roadway. (CMAQ funds are for bicycle and pedestrian improvements only. Emission Benefits in kg/day: 0.9 ROG, 0.51 NOx, 0.16 PM10) (PLA25501)	$32,612	X	X	X	X	X	X	X

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									Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
CV_157	Central Valley	Inter/Intra-state	03	SAC	5	As part of the I-5 Managed Lanes Project from 1.4 miles south of I-5/U.S. 50 interchange to 0.4 miles south of the Yolo County line (26 total lane miles), construct auxiliary lanes and extend deceleration and acceleration lanes in both directions on I-5 from 0.4 mile north of the southbound SR 99/I-5 Connector OC (24-0241F) to the Yolo County line. Intelligent transportation system (ITS) infrastructure will be added to actively manage recurrent and non-recurrent congestion. This corridor is experiencing recurring congestion during peak commute periods and the congestion is expected to increase as suburban development continues in Sacramento and surrounding areas (4H581)	As part of the I-5 Managed Lanes Project from 1.4 miles south of I-5/U.S. 50 interchange to 0.4 miles south of the Yolo County line (26 total lane miles), construct auxiliary lanes and extend deceleration and acceleration lanes in both directions on I-5 from 0.4 mile north of the southbound SR 99/I-5 Connector OC (24-0241F) to the Yolo County line. Intelligent transportation system (ITS) infrastructure will be added to actively manage recurrent and non-recurrent congestion. This corridor is experiencing recurring congestion during peak commute periods and the congestion is expected to increase as suburban development continues in Sacramento and surrounding areas (4H581)	$17,000	X	X	X	X	X	X	X
CV_158	Central Valley	Inter/Intra-state	03	SAC	5	In Sacramento County, I-5 at Metro Air Parkway near Sacramento International Airport, construct the first phae of a five-lane partial clover Type L-9 interchange for Metro Air Parkway at Interstate 5 (I-5). Construct a three lane overcrossing facility with a median, bike lanes and a sidewalk on the west side. Metro Air Parkway will connect on the north of the interchange and terminate south of I-5 with a cul-de-sac. South Bayou Rd will be realigned to provide the R/W for partial completion of two-quadrant partial cloverleaf interchange. Project also includes a one-lane northbound I-5 exit ramp and diagonal entrance ramp, one-lane southbound I-5 exit ramp, a two-lane southbound I-5 loop entrance ramp with auxiliary lane, street lighting, striping, signs, relocation of an existing drainage ditch on the south side of the freeway, construction of drainage improvements with the interchange, and relocation of utilities (SAC18150)	In Sacramento County, I-5 at Metro Air Parkway near Sacramento International Airport, construct the first phae of a five-lane partial clover Type L-9 interchange for Metro Air Parkway at Interstate 5 (I-5). Construct a three lane overcrossing facility with a median, bike lanes and a sidewalk on the west side. Metro Air Parkway will connect on the north of the interchange and terminate south of I-5 with a cul-de-sac. South Bayou Rd will be realigned to provide the R/W for partial completion of two-quadrant partial cloverleaf interchange. Project also includes a one-lane northbound I-5 exit ramp and diagonal entrance ramp, one-lane southbound I-5 exit ramp, a two-lane southbound I-5 loop entrance ramp with auxiliary lane, street lighting, striping, signs, relocation of an existing drainage ditch on the south side of the freeway, construction of drainage improvements with the interchange, and relocation of utilities (SAC18150)	$24,139	X	X		X	X	X	X

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Project Reference ID	CFMP Region	Project Category	District	County	Route	Project Name	Project Description	Cost (1,000 USD)	Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
CV_159	Central Valley	Inter/Intra-state	03	SAC	12	In Sacramento County at the Sacramento River Bridge (Br#23-0024), SR 12 Rio Vista Bridge improvements (CAL21283)	In Sacramento County at the Sacramento River Bridge (Br#23-0024), SR 12 Rio Vista Bridge improvements (CAL21283)	$22,860	X	X			X	X	X
CV_160	Central Valley	Inter/Intra-state	03	SAC	16	In Sacramento County on Jackson Highway (SR 16), widen 4 lanes from South Watt Ave to Grant Line Road (CAL15410)	In Sacramento County on Jackson Highway (SR 16), widen 4 lanes from South Watt Ave to Grant Line Road (CAL15410)	$100,000	X	X			X	X	X
CV_161	Central Valley	Inter/Intra-state	03	SAC	51	SR 51, from J Street to Arden Way: Extend managed lanes, widen the American River Bridge to 10 lanes (4 lanes NB and SB plus managed lane in both directions) and add new Class IV bike path on the American River Bridge, new auxiliary lane from Exposition Blvd to E St in both directions, SB auxiliary lane from Arden Way on-ramp to Exposition Blvd off-ramp, replace B St UP, A St OC, Elvas UP, widen EB 160 and SR 51 separation structure, and widen Tribute Rd UC. (PE Only. Toll Credits for PE.). Toll Credits for ENG. 0H931 (HOV) 0316000113 and 3F070 (American Rvr Br). 0312000054 (CAL20594)	SR 51, from J Street to Arden Way: Extend managed lanes, widen the American River Bridge to 10 lanes (4 lanes NB and SB plus managed lane in both directions) and add new Class IV bike path on the American River Bridge, new auxiliary lane from Exposition Blvd to E St in both directions, SB auxiliary lane from Arden Way on-ramp to Exposition Blvd off-ramp, replace B St UP, A St OC, Elvas UP, widen EB 160 and SR 51 separation structure, and widen Tribute Rd UC. (PE Only. Toll Credits for PE.). Toll Credits for ENG. 0H931 (HOV) 0316000113 and 3F070 (American Rvr Br). 0312000054 (CAL20594)	$483,000	X	X	X	X	X	X	X
CV_162	Central Valley	Inter/Intra-state	03	SAC	51	Construct transition lanes on SR 51 NB from Marconi Ave to Fulton Ave and SB from Fulton Ave to Watt Ave (CAL20596)	Construct transition lanes on SR 51 NB from Marconi Ave to Fulton Ave and SB from Fulton Ave to Watt Ave (CAL20596)	$84,700	X	X			X	X	X
CV_163	Central Valley	Inter/Intra-state	03	SAC	OFF	In Sacramento County, construct new 4 lane road (Easton Valley Parkway, Widening A) from Hazel Ave to Prairie City Road (SAC24529)	In Sacramento County, construct new 4 lane road (Easton Valley Parkway, Widening A) from Hazel Ave to Prairie City Road (SAC24529)	$36,000	X	X			X	X	X
CV_164	Central Valley	Inter/Intra-state	03	SAC	OFF	In Sacramento County, on Hazel Avenue between Folsom Boulevard and U.S. Highway 50, multi-modal corridor improvements, interchange improvements; widen from 4 lanes to 6 lanes of Hazel Avenue between Folsom Boulevard and U.S. Highway 50 (SAC24255)	In Sacramento County, on Hazel Avenue between Folsom Boulevard and U.S. Highway 50, multi-modal corridor improvements, interchange improvements; widen from 4 lanes to 6 lanes of Hazel Avenue between Folsom Boulevard and U.S. Highway 50 (SAC24255)	$82,563	X	X			X	X	X
CV_165	Central Valley	Inter/Intra-state	03	SAC	OFF	On Madison Ave from Fair Oaks Blvd to Hazel Ave, widen from 4 to 6 lanes (SAC16500)	On Madison Ave from Fair Oaks Blvd to Hazel Ave, widen from 4 to 6 lanes (SAC16500)	$29,045	X	X		X	X	X	X

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									Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
CV_166	Central Valley	Inter/Intra-state	03	SAC	OFF	Environmental will be for both this project and the County of Sacramento project SAC24249. Enviornmental completed for White Rock Road Sunrise Blvd to Grant Line Road. In the City of Ranch Cordova, construction will include: On existing 6-lane White Rock Rd., from Sunrise Blvd. to Luyung Dr.: construct improvements, including Class II bikeway. On White Rock Rd from Luyung Dr. to eastern City Limits: widen and reconstruct from 2 to 4 lanes and construct Class II bikeway. (CMAQ funds only to be used for new bicycle facilities.) (Emission Benefits in kg/day: 0.03 ROG, 0.03 NOx, 0.02 PM10). Additional construction will be completed under the Sacramento County project SAC24662 (SAC24470)	Environmental will be for both this project and the County of Sacramento project SAC24249. Enviornmental completed for White Rock Road Sunrise Blvd to Grant Line Road. In the City of Ranch Cordova, construction will include: On existing 6-lane White Rock Rd., from Sunrise Blvd. to Luyung Dr.: construct improvements, including Class II bikeway. On White Rock Rd from Luyung Dr. to eastern City Limits: widen and reconstruct from 2 to 4 lanes and construct Class II bikeway. (CMAQ funds only to be used for new bicycle facilities.) (Emission Benefits in kg/day: 0.03 ROG, 0.03 NOx, 0.02 PM10). Additional construction will be completed under the Sacramento County project SAC24662 (SAC24470)	$18,366	X	X	X	X	X	X	X
CV_167	Central Valley	Inter/Intra-state	03	SAC	OFF	In Folsom, White Rock Road from Prairie City Road to Carson Crossing Road, construct 4-lane expressway (SAC24250)	In Folsom, White Rock Road from Prairie City Road to Carson Crossing Road, construct 4-lane expressway (SAC24250)	$66,000	X	X			X	X	X
CV_168	Central Valley	Inter/Intra-state	03	SAC	VAR	In the City of Sacramento, in Sacramento County, from 0.5 miles south of Interstate 5/ State Route 50 separation to I-5/I-80 Separation. Strengthen/replace structures for permit load rating (BR#24-0267, 24-0068L, 24-0068R) (3H390)	In the City of Sacramento, in Sacramento County, from 0.5 miles south of Interstate 5/ State Route 50 separation to I-5/I-80 Separation. Strengthen/replace structures for permit load rating (BR#24-0267, 24-0068L, 24-0068R) (3H390)	$60,000	X	X			X	X	X
CV_169	Central Valley	Inter/Intra-state	03	SOL	VAR	I-80 Kidwell Road IC to U.S. 50/I-5 IC and I-80 West El Camino interchange. Construct managed lanes; construct new separate pedestrian/bike path (3H900) (CAL21276)	I-80 Kidwell Road IC to U.S. 50/I-5 IC and I-80 West El Camino interchange. Construct managed lanes; construct new separate pedestrian/bike path (3H900) (CAL21276)	$440,000	X	X	X	X	X	X	X
CV_170	Central Valley	Inter/Intra-state	03	SUT	20 99	In Sutter County at existing SR 20/SR 99 intersection: SR 20/SR 99 interchange (1H770) 0316000270	In Sutter County at existing SR 20/SR 99 intersection: SR 20/SR 99 interchange (1H770) 0316000270	$196,546	X	X			X	X	X
CV_171	Central Valley	Inter/Intra-state	03	SUT	5th St Bridge	In the City of Yuba City, 5th St/Bridge St crossing over the Feather River/2nd St, between Marysville and Yuba City, replace two-lane bridge with 4-lane bridge (SUT10828)	In the City of Yuba City, 5th St/Bridge St crossing over the Feather River/2nd St, between Marysville and Yuba City, replace two-lane bridge with 4-lane bridge (SUT10828)	$89,103	X	X		X	X	X	X

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CV_172	Central Valley	Inter/Intra-state	03	YOL	5	I-5 Colusa-Yolo bundle (Accl'd Freight Bridge)	Increase vertical clearance on 5 structures: BR#22-0155 - YOL 5, CR 96 OC (PM R014.27); BR#22-0156 - YOL 5, CR 95 OC (PM R015.85); BR#22-0157 - YOL 5, Zamora OC (PMR017.62); BR#15-0067 - COL 5, E Street OC (PM R017.98); BR#15-0075 - COL 5 , Lurline Ave OC (PM R022.74). Project has funds allocated to it for a PID. It is not currently listed in the 2016 SACOG MTP/SCS but can be amended in at a future time. (EA 3H391) 0317000349	$53,692	X	X	X		X	X	X
CV_173	Central Valley	Inter/Intra-state	03	YOL	5	I-5 Multiple structures. Raise structure or lower roadway profile. (0F760)	Raise structure or lower roadway profile. Project has funds allocated to it for a PID. It is not currently listed in the 2016 SACOG MTP/SCS but can be amended in at a future time. BR#22-0158 - YOL 5, WYE Line OC (PM 004.49); BR#22-0139 - YOL 5, County Line Road OC (PM R028.92) (0F760)	$18,315	X	X	X		X	X	X
CV_174	Central Valley	Inter/Intra-state	03	YOL	16	Phase 2: Shoulder widening, curve correction, left-turn channelization, signalization and two-way left-turn lanes on SR 16 near Cadenasso, from 0.4 mile west of County Road 79 to 0.4 mile east of County Road 79; also from Esparto to 0.2 mile west of Route 505 (0314000272) (CAL20528)	Phase 2: Shoulder widening, curve correction, left-turn channelization, signalization and two-way left-turn lanes on SR 16 near Cadenasso, from 0.4 mile west of County Road 79 to 0.4 mile east of County Road 79; also from Esparto to 0.2 mile west of Route 505 (0314000272) (CAL20528)	$37,299	X	X			X	X	X
CV_175	Central Valley	Inter/Intra-state	03	YOL	50	Route 50 at various locations. Inductive loop replacement.	Route 50 at various locations. Inductive loop replacement.	$2,000	X	X				X	X
CV_176	Central Valley	Inter/Intra-state	03	YOL	50	In Sacramento, Yolo, and El Dorado Counties, ICM projects on U.S. 50 between Enterprise Blvd in West Sacramento and Cameron Park Drive in El Dorado County (CAL21096)	In Sacramento, Yolo, and El Dorado Counties, ICM projects on U.S. 50 between Enterprise Blvd in West Sacramento and Cameron Park Drive in El Dorado County (CAL21096)	$45,530	X	X	X		X	X	X
CV_177	Central Valley	Inter/Intra-state	03	YOL	80	In Sacramento County in West Sacramento, I-80, at the Sacramento River Bridge and Overhead #22-0026L/R (PM R11.3) (G13 Contingency Project - Rehabilitate Bridge (Toll Credits). Toll Credits for ENG, ROW. (0F250) 0300000075	In Sacramento County in West Sacramento, I-80, at the Sacramento River Bridge and Overhead #22-0026L/R (PM R11.3) (G13 Contingency Project - Rehabilitate Bridge (Toll Credits). Toll Credits for ENG, ROW. (0F250) 0300000075	$39,479	X	X	X		X	X	X
CV_178	Central Valley	Inter/Intra-state	03	YOL	80	I-80 various locations. Inductive loop replacement.	I-80 various locations. Inductive loop replacement.	$2,000	X	X			X	X	X
CV_179	Central Valley	Inter/Intra-state	03	YOL	80 5	In Sacramento & Yolo County; Yolo 80 PM 9.2 / R9.552; Yolo 50 PM 0-3.156; Sac 50 PM L0-17.5. Improve communications & install ITS elements. (3H330) 0317000325	In Sacramento & Yolo County; Yolo 80 PM 9.2 / R9.552; Yolo 50 PM 0-3.156; Sac 50 PM L0-17.5. Improve communications & install ITS elements. (3H330) 0317000325	$47,000	X	X		X	X	X	X
CV_180	Central Valley	Inter/Intra-state	03	YOL	OFF	Complete design and environmental clearance of a proposed joint flood-protection improvement and transportation connection linking Southport to the Port Industrial Complex (YOL19434)	Complete design and environmental clearance of a proposed joint flood-protection improvement and transportation connection linking Southport to the Port Industrial Complex (YOL19434)	$18,750	X	X	X		X	X	

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CV_181	Central Valley	Inter/Intra-state	06	FRE	41	RTE 41 2-LN EXPRWY to 4-LN EXPRWY North of Elkhorn	RTE 41 2-LN EXPRWY to 4-LN EXPRWY North of Elkhorn	$65,000		X	X		X	X	
CV_182	Central Valley	Inter/Intra-state	06	FRE	41	NB On-Ramp from Ashlan to NB Off-Ramp Shaw Ave.	NB On-Ramp from Ashlan to NB Off-Ramp Shaw Ave.	$14,000	X					X	X
CV_183	Central Valley	Inter/Intra-state	06	KER	46	Route 46 C/E Segment 4B	Widen 2-lane conventional highway to 4-lane conventional expressway	$51,100		X			X	X	X
CV_184	Central Valley	Inter/Intra-state	06	KER	58/99	Centennial Connector Phase II: interchange safety auxiliary lane improvements on national truck corridor	Centennial Connector Phase II: interchange safety auxiliary lane improvements on national truck corridor	$62,300	X	X			X	X	X
CV_185	Central Valley	Inter/Intra-state	06	MAD	41	4-LN Exwy on New Alignment	4-LN Exwy on New Alignment	$85,000		X		X	X	X	
CV_186	Central Valley	Inter/Intra-state	06	MAD	99	South Madera 6-Lane	1.7 / 7.5 - Widen SR 99 from 4 to 6 lanes from Avenue 7 to Avenue 12	$159,000	X	X	X		X	X	X
CV_187	Central Valley	Inter/Intra-state	06	TUL	99	Tulare City Widening	25.5/30.6 Tulare - Avenue 200 to Prosperity Ave. Widen from 4 to 6 Lanes	$200,150	X	X			X	X	X
CV_188	Central Valley	Inter/Intra-state	09	KER	14	Freeman Gulch 3	Convert 2-lane conventional highway to a four-lane expressway on SR 14 from PM 45.9-53.0 in Kern County to improve safety, improve multimodal access through shoulder widening, build/improve drainage and wildlife crossing structures, improve rural community lifeline access, improve freight access and goods movement.	$47,000		X	X		X		X
CV_189	Central Valley	Inter/Intra-state	09	KER	14	Freeman Gulch 2	Convert 2-lane conventional highway to a four-lane expressway on SR 14 from PM 45.9-53.0 in Kern County to improve safety, improve multimodal access through shoulder widening, build/improve drainage and wildlife crossing structures, improve rural community lifeline access, improve freight access and goods movement.	$68,000		X	X		X		X
CV_190	Central Valley	Inter/Intra-state	09	KER	58	SR 58 Truck Climbing Lane	SR 58 Truck Climbing Lane: Construct eastbound truck climbing lane to improve air quality via throughput, connectivity and accessibility of a major freight corridor from the Central Valley to parts east, improve safety by removing slow moving trucks from steep grades, and improve the connectivity and resiliency of the freight system to eastern markets.	$180,000		X	X		X		X
CV_191	Central Valley	Inter/Intra-state	09	KER	58	Upgrade SR 58 from PM M117.0 to PM R129.7 from an expressway to a restricted access freeway.	Upgrade SR 58 from PM M117.0 to PM R129.7 from an expressway to a restricted access controlled freeway to improve safety; improve bridges, pavement and structures; and better define the access and connectivity of the highway to improve the freight system.	$83,000		X			X		X
CV_192	Central Valley	Inter/Intra-state	10	MER	99	PM R28.2/R37.3, South Bound Livingston Widening from two to three lanes	Caltrans proposes the construction of a new freeway lane in the southbound direction by widening the median. The project is on State Route 99 (SR 99) and starts 0.80 miles south of the Hammatt Avenue Overcrossing located at post mile (PM) R28.2 and ends at the Merced/Stanislaus County line located at PM R37.3 in Merced County. The proposed Livingston Southbound Median Widening project (Project) will widen the existing two lane freeway to a three lane freeway in the southbound direction to provide capacity needed to accommodate growth in traffic forecasted through the year 2035.	$37,420	X	X					
CV_193	Central Valley	Inter/Intra-state	10	SJ	99	PM 4.6/6.3, SR 99 and SR 120 Interchange Improvements (west)	PM 4.6/6.3, SR 99 and SR 120 Interchange Improvements (west)	$60,511	X	X		X	X	X	X
CV_194	Central Valley	Inter/Intra-state	10	SJ	205	PM 0.8/2.0, Convert the existing compact Diamond interchange to a partial cloverleaf interchange	PM 0.8/2.0, Convert the existing compact Diamond interchange to a partial cloverleaf interchange	$19,200	X	X		X	X	X	X

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CV_195	Central Valley	Inter/Intra-state	10	SJ	580	PM 13.0/14.2, Mountain House Parkway (MHP) at I-580 Interchange	PM 13.0/14.2, Mountain House Parkway (MHP) at I-580 Interchange	$5,760	X	X		X	X	X	X
CV_196	Central Valley	Inter/Intra-state	10	SJ	580	PM 12.6, /14.3, Convert the compact diamond interchange to a Divergent Diamond Interchange	PM 12.6, /14.3, Convert the compact diamond interchange to a Divergent Diamond Interchange	$22,000	X	X		X	X	X	X
CV_197	Central Valley	Inter/Intra-state	10	STA	99	SR 99/Service Rd/ Mitchell Rd Interchange	PM 9.5/R11.4, Construct a full interchange in a diverging diamond configuration at SR 99/Service Road, a partial interchange with ramps connecting Mitchell Road and SR 99 to the south, and various improvements on the local roads within the project limits.	$134,000	X	X			X	X	
CV_198	Central Valley	Inter/Intra-state	10	STA	132	132 Extension Dakota to Gates	5.5/11.5, SR 132 Dakota Avenue to Gates Road Capacity Improvement	$117,000	X	X		X	X	X	
CV_199	Central Valley	Inter/Intra-state	10	STA	132	State Route 99 to Dakota Ave (Phase 2 Ultimate 4 lane facility with SR-99 connections)	11.0/15.0, Sta -132, 15.7/17.5, Sta 99, 99 to Dakota, 2 to 4 lanes	$160,000	X	X		X		X	X
CV_200	Central Valley	Inter/Intra-state	10	STA	OFF	North County Corridor	STA-108,120-R27.5/R45.5.10.5/R12.5 to Tully Road: Construct a two to six lane expressway.	$680,000	X	X		X	X	X	X
CV_201	Central Valley	Inter/Intra-state	10	STA	OFF	Crows Landing Road	On Crows Landing Road, replace and upgrade the San Joaquin River Bridge-- Seismic Bridge replacement - 3-lane Bridge	$18,000	X	X		X		X	
CV_202	Central Valley	Inter/Intra-state	10	STA	OFF	Dale Road Widening I	Widen Dale Road from 4 to 6 lanes, from Pelandale Avenue to Kiernan Road	$7,600	X	X				X	X
CV_203	Central Valley	Inter/Intra-state	10	STA	OFF	Dale Road Widening II	Widen Dale Road from 4 to 6 lanes, from Pelandale Avenue to Kiernan Road	$3,800	X	X		X	X	X	
CV_204	Central Valley	Inter/Intra-state	10	STA	OFF	Faith Home	Construct 4 lane Expressway on Faith Home Road from Hatch Road to Garner Road	$71,700	X	X		X	X	X	
CV_205	Central Valley	Inter/Intra-state	10	STA	OFF	McHenry	Widen McHenry Avenue Between Ladd Road and Stanislaus River Bridge to 5 lanes	$13,025	X	X		X	X	X	
CV_206	Central Valley	Inter/Intra-state	10	STA	OFF	Seventh Street	On Seventh Street replace and upgrade Tuolumne River Bridge--Seismic Bridge replacement;	$45,000	X	X					
CV_207	Central Valley	Inter/Intra-state	10	STA	OFF	South County Corridor	Construct 2-6 Lane Expressway on new alignment, Turlock City Limits to Interstate 5	$278,000	X	X		X		X	

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LAIE_209	Los Angeles / Inland Empire	Port Access	07	LA	47	SR 47 Navy Way Interchange	Construction of interchange at SR 47/Navy Way to eliminate traffic signal and movement conflicts; this project was a S. CA trade corridor Tier II TCIF project as submitted to the CTC in 2008; project removes last signal on SR 47 between Desmond and V. Thomas bridges, NHS intermodal connector route	$50,000	X	X	X	X	X	X	X
LAIE_210	Los Angeles / Inland Empire	Port Access	07	LA	47	SR 47/Vincent Thomas Bridge/Front St. Interchange	New westbound SR 47 on- and off-ramps at Front Street just west of the Vincent Thomas Bridge and eliminate the existing non-standard ramp connection to the Harbor Boulevard off-ramp; Front Street is an NHS connector. The project also includes realigned eastbound and westbound SR 47 on-ramps.	$31,600		X	X	X	X	X	X
LAIE_211	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Port of Long Beach	This component (Fourth Track at Ocean Boulevard) will add a 3,000-foot railroad track to eliminate a bottleneck at the Ocean Boulevard overcrossing, realign the existing lead track, and reconfigure crossovers and turnouts. project includes 1) add a 3,000 ft railroad track, 2) slide existing track eastward, 3) relocate retaining wall, 4) relocate harbor scenic drive 15 ft eastward, 5) narrow harbor scenic drive's shoulders, 6) construct retaining walls along the affected roadway, 7) protect utility casing, 8) modify centralized traffic control (CTC), control point (CP) ocean, 9) protect bridge column	$25,000	X	X	X	X	X	X	X
LAIE_212	Los Angeles / Inland Empire	Port Access	07	LA	OFF	POLA Pier 300 modernization	Port of Los Angeles zero emission (ZE)/truck trip reduction/freight efficiency program: Pier 300 railyard modernization	$100,000	X	X	X	X	X	X	X
LAIE_213	Los Angeles / Inland Empire	Port Access	07	LA	OFF	POLA West Basin Container Termnainal - railyard upgrades, electrified rail-mounted gantry cranes	Port of Los Angeles zero emission (ZE)/truck trip reduction/freight efficiency program: west basin container terminal railyard modernization	$60,000	X	X	X	X	X	X	X
LAIE_214	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Port of Los Angeles	Zero emission (ZE)/truck trip reduction/freight efficiency program: TICTF modernization (16-track railyard operated w/electrified rail-mounted gantry cranes.	$100,000	X	X	X	X	X	X	X
LAIE_215	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Port of Los Angeles	Alameda Corridor Southern Terminus Gap Closure project. This project will provide separate rail access to two adjacent on-dock railyards, thus eliminating the potential for train collisions. The new double track segment will also reduce moving train blockages at two immediately adjacent rail crossings on roadways, which also reduces the potential for train-vehicular collisions.	$9,500	X	X	X	X	X	X	X
LAIE_216	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Pico Ave. widen and rebuild	Widen and rebuild Pico Ave. from Pier D Ave. to Pier E Street. Prepare PS&E. Work includes widening, replace existing pavement POLB lead signing/striping.	$5,900	X	X	X		X	X	X
LAIE_217	Los Angeles / Inland Empire	Port Access	07	LA	OFF	PAVEMENT, CAPACITY EXPANSION, LANDSCAPE IMPROVEMENTS.	HARBOR SCENIC DRIVE FROM I-710 TO PIER J AVENUE BRIDGE (ROADWAY IMPROVEMENT AND REHABILITATION) - REPLACE THE EXISTING PAVEMENT FULL DEPTH ON HARBOR SCENIC DRIVE FROM HARBOR PLAZA TO GRADE SEPARATION SOUTHERLY. PROJECT IS TO IMPROVE SAFETY FEATURES, CAPACITY, AND LANDSCAPE. IMPROVE OPERATION EFFICIENCY WITH ADVANCE SIGNAGE. ENHANCE LANDSCAPE.	$23,700	X	X			X	X	X
LAIE_218	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Port project - realignment	Pier D Street realignment project. Realign Pier D St between middle harbor out gate and Pico Ave and Broadway between old POLB maintenance yard (western terminus) of the roadway) and Pico Ave.	$32,000	X	X	X	X	X	X	X
LAIE_219	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Pier B Street Freight Corridor Reconstruction	(1) Realigns Pier B St between Pico Av and Anaheim St and widens into 2 lanes in each direction to improve goods movement mobility and enhance pedestrian travel. (2) Realigns Pico Ave to the west from Pier B St/I-710 Ramps to Pier D St. (3) Constructs new sidewalk on the south side of Pier B St and along the west side of Pico Ave. (4) Close the at-grade railroad crossing at 9th Street.	$150,000	X	X	X	X	X	X	X
LAIE_220	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Pier G Ave. STORMWATER, SEWER AND STREET PAVEMENT	Roadway improvements and utility enhancements for water, stormwater, sewer, and street pavement. Utility improvements are combined with the roadway improvements for preventative maintenance and cost efficiency.	$15,000	X		X		X	X	X

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LAIE_221	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Port of Long Beach	Terminal Island Wye Track Realignment - this project will provide for double tracking the south leg of the wye to accommodate simultaneous train switching moves from these various activities on terminal island.	$40,000	X	X	X	X	X	X	X
LAIE_222	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Port of Los Angeles	Terminal Island railyard enhancement project: Provide five additional storage tracks adjacent to the Pier 400 rail yard	$34,000	X	X	X	X	X	X	X
LAIE_223	Los Angeles / Inland Empire	Port Access	07	LA	OFF	POLB Pier B Reconstruciton	Pier B Intermodal Railyard Expansion. Project will expand Pier B intermodal railyard to facilitate additional rail shipments.	$720,000	X	X	X	X	X	X	X
LAIE_224	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Port of Los Angeles	Alameda Corridor enhancement - triple track s/o Thenard Junction	$20,000	X	X	X		X	X	X
LAIE_225	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Port of Los Angeles	Alameda Corridor southern terminus enhancement- b200 railyard connection expansion (2nd track)	$20,000	X	X	X		X	X	X
LAIE_226	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Port of Los Angeles	Alameda Corridor terminus enhancement - new Cerritos Channel rail bridge	$400,000	X	X			X	X	X
LAIE_227	Los Angeles / Inland Empire	Port Access	07	LA	OFF	Port of Los Angeles	Terminal island railyard enhancement, Phase II - Pier 400 second lead track	$15,000	X	X	X	X	X	X	X
LAIE_228	Los Angeles / Inland Empire	Port Access	07	VEN	OFF	Port of Hueneme ITS, solar installation, EV charging for reefers	Port Corridor Optimization & Efficiency Project includes reconfiguration of terminal traffic circulation, intelligent transportation systems (ITS), electrical system upgrades for reefers, and a solar power component to progress zero emission initiatives.	$12,000	X	X	X	X	X	X	X
LAIE_229	Los Angeles / Inland Empire	Port Access	07	VEN	OFF	Port of Hueneme capacity expansion - auto import/export parking structure, ITS	Stacked Project (Structure for Transfer of Automobiles Creating Key Economic Development) will entail a 3 story tall parking like structure for a last/first point of rest for automobile exports/imports. It will increase Port capacity by 33%, increase efficiency with ITS technology and electrical upgrades with solar power. It will create 724 new long-term jobs, $36.5 million in local business revenue, and $6 million in state/local tax revenue.	$40,000	X	X	X	X	X	X	X
LAIE_230	Los Angeles / Inland Empire	Port Access	07	VEN	OFF	Port of Hueneme EV charging stations, solar installation, energy storage	LEAP: Leading Electric Advancements for Ports Project will include Solar panel installation, clean energy storage, 3 UTRs, and the infrastructure for new clean energy charging stations for port ZEVs.	$2,300	X	X	X	X	X	X	X
LAIE_231	Los Angeles / Inland Empire	Port Access	07	VEN	OFF	Port Capacity expansion - In widening	Hueneme Rd from Oxnard City limits to Rice Rd - widen from 2 to 4 lanes (Phase I)	$7,000	X	X		X	X	X	X
LAIE_232	Los Angeles / Inland Empire	Port Access	07	VEN	OFF	Port of Hueneme Intermodal Improvement Project	Port of Hueneme Intermodal Improvement Project to modernize the Port's wharf and pier and cargo facilities including deepening the water depth from the channel to vessel berths and extending rail for on-terminal access.	$30,800	X	X	X	X	X	X	X
LAIE_233	Los Angeles / Inland Empire	Port Access	07	VEN	OFF	Port of Hueneme Intermodal Infrastructure Project	The Port of Hueneme Intermodal Infrastructure Project will include dredging of the harbor channel from 35 ft. to 40 ft. deep to accommodate heavier ships with more cargo on them, modernization of cargo facilities and on-dock rail spur updating.	$19,000	X	X	X	X	X	X	X
LAIE_234	Los Angeles / Inland Empire	Port Access	07	VEN	OFF	Port Hueneme Intermodal Improvement Project	Intermodal Improvement Project: Wharf & Berth Improvements includes repaving of the terminal surfaces at each of the Berths.	$3,300	X	X			X	X	X
LAIE_235	Los Angeles / Inland Empire	Rail Systems	07	LA	OFF	Link Union Station Phase A: Track and Signal Modernization	Link Union Station Phase A: Track and Signal Modernization Project to modernize track and signal systems in the throat of LA Union Station necessary prior to construction of Link U.S. project. Link U.S. transforms Union Station from a stub-end station to a run-through station, extending tracks over U.S. 101 and allows for trains to enter or exit the station from both the north and south ends.	$80,000	X	X	X	X	X	X	X
LAIE_236	Los Angeles / Inland Empire	Rail Systems	07	LA	OFF	Antelope Valley Line	Antelope Valley Line capacity improvement project: add capacity between Los Angeles Union Station and Lancaster where UP operates freight trains. Phase I includes double track sections, Burbank Junction speed improvements, and signal respacing. The project will eliminate rail bottlenecks and improve travel time and reliability for both freight and commuter rail.	$856,400	X	X	X	X	X	X	

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LAIE_237	Los Angeles / Inland Empire	Rail Systems	07	LA	OFF	LANE EXPANSION, HS RAIL ALIGNMENT	Brighton to Roxford double track: This project adds 11 miles of 2nd track between Burbank and Sylmar on Metrolink's Antelope Valley Line (AVL). The project will eliminate the current bottleneck and improve on time performance and operational reliability on the AVL. This project will be designed to be compatible with the potential future high speed rail alignment.	$238,000	X	X	X	X	X	X	
LAIE_238	Los Angeles / Inland Empire	Rail Systems	07	LA	OFF	DOUBLE TRACK FOR SHARED FREIGHT / COMMUTER RAIL	Lone Hill Avenue to Control Point (CP) White Double Track. With the proposed 3.9 mile project segment, an existing siding will be lengthened to provide 8.1 miles of continuous double track between Lone Hill Ave and CP Central. The project is currently in the PAED phase.	$130,000	X	X	X	X	X	X	
LAIE_239	Los Angeles / Inland Empire	Rail Systems	07	LA	OFF	LA Urban Mobility Corridor – LA-Fullerton Segment: I-5/710 Flyover	LA Urban Mobility Corridor – LA-Fullerton Segment: I-5/710 Flyover: (Construct a two-track, passenger-only elevated structure to carry passenger trains over freight tracks to the south side of BNSF ROW, eliminating passenger-versus-freight conflicts).	$52,000	X	X	X	X	X	X	X
LAIE_240	Los Angeles / Inland Empire	Rail Systems	07	LA	OFF	LA Urban Mobility Corridor - LA-Fullerton Segment: New Commerce Intermodal Facility	LA Urban Mobility Corridor - LA-Fullerton Segment: New Commerce Intermodal Facility (Property acquisition to allow current Commerce Intermodal Facility to shift south and accommodate separation of freight and passenger conflicts).	$96,400	X	X	X	X	X	X	X
LAIE_241	Los Angeles / Inland Empire	Rail Systems	07	LA	OFF	LA Urban Mobility Corridor - LA-Fullerton Segment: 26th Street ROW Acquisition	LA Urban Mobility Corridor - LA-Fullerton Segment: 26th Street ROW Acquisition (Acquisition of the northern half of 26th Street to allow BNSF to construct new tracks at Hobart Yard, allowing BNSF to vacate the West Bank Yard. Relocating BNSF's West Bank Yard activity is a prerequisite to enable full utilization of the first run-through tracks at Los Angeles Union Station, which are to be operational by 2026.	$296,900	X	X	X	X	X	X	X
LAIE_242	Los Angeles / Inland Empire	Rail Systems	07	LA	OFF	LA Urban Mobility Corridor – LA-Fullerton Segment: Malabar Yard Connector/49th Street Closure	LA Urban Mobility Corridor – LA-Fullerton Segment: Malabar Yard Connector/49th Street Closure (Constructs a new section of track to connect BNSF Malabar Yard with the Los Angeles Railway Junction through E 46th Street and permanently closes the 49th Street grade railroad crossing).	$20,600	X	X	X	X	X	X	X
LAIE_243	Los Angeles / Inland Empire	Rail Systems	08	SBD	OFF	San Bernardino Intermodal Rail Yard	Track and intermodal yard improvements (phases 1 through 4)	$800,000	X	X	X	X	X	X	X
LAIE_244	Los Angeles / Inland Empire	Grade Separations	07	LA	OFF	Grade Separation --Montebello	At Grade Crossing Safety Improvement	$7,000	X	X	X	X	X	X	X
LAIE_245	Los Angeles / Inland Empire	Grade Separations	07	LA	OFF	Grade Separation -- Montebello	Montebello/Maple	$164,800	X	X	X	X	X	X	X
LAIE_246	Los Angeles / Inland Empire	Grade Separations	07	LA	OFF	Grade Separation -- Industry/LA County	Fullerton Rd	$152,400	X	X	X	X	X	X	X
LAIE_247	Los Angeles / Inland Empire	Grade Separations	07	LA	OFF	Grade Separation -- Pico Rivera	Durfee Ave	$91,100	X	X	X	X	X	X	X
LAIE_248	Los Angeles / Inland Empire	Grade Separations	07	LA	OFF	Grade Separation -- Santa Fe Spring	Rosecrans Ave	$156,400	X	X	X	X	X	X	X
LAIE_249	Los Angeles / Inland Empire	Grade Separations	07	LA	OFF	Grade Separation -- Industry/LA County	Turnbull Canyon Rd	$86,200	X	X	X	X	X	X	X
LAIE_250	Los Angeles / Inland Empire	Grade Separations	07	LA	OFF	Grade Separation -- Los Angeles	Doran St	$159,000	X	X	X	X	X	X	
LAIE_251	Los Angeles / Inland Empire	Grade Separations	07	LA	OFF	Grade Separation --San Gabriel Valley/Alhambra/LA subdivision	Grade Separation Crossing Safety Improvements	$1,600,000	X	X	X	X	X	X	X
LAIE_252	Los Angeles / Inland Empire	Grade Separations	07	LA	OFF	Grade Separation -- Pomona	At Grade Crossing Safety Improvement	$22,900	X	X	X	X	X	X	X
LAIE_253	Los Angeles / Inland Empire	Grade Separations	07	VEN	OFF	Oxnard Rice Ave	Grade Separation Improvements Countywide	$79,200	X	X	X	X	X	X	X

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LAIE_254	Los Angeles / Inland Empire	Grade Separations	07	VEN	OFF	Ventura County Transportation Commission	Grade Separation Improvements Countywide	$147,300	X	X	X	X	X	X	
LAIE_255	Los Angeles / Inland Empire	Grade Separations	08	RIV	OFF	Madison St. Grade Sep	In Riverside - Madison St grade separation: construct a 4- ln (2 lns in ea dir) noncapacity enhancing Madison st/BNSF underpass between Indiana ave and Peters st/Ysmael villegas st.	$38,000	X	X	X	X	X		X
LAIE_256	Los Angeles / Inland Empire	Grade Separations	08	RIV	OFF	Mary Street Grade Crossing	In Riverside on Mary street: replace existing 4 ln (2 lanes in each direction) right/right crossing with a 4 ln (2 lns in each direction - non-capacity) U.C. grade separation on Mary st between Marguerite ave and Indiana ave.	$38,000	X	X	X	X	X		X
LAIE_257	Los Angeles / Inland Empire	Grade Separations	08	RIV	OFF	Beaumont	California Avenue/UP Rail Crossing	$36,000	X	X	X	X	X		X
LAIE_258	Los Angeles / Inland Empire	Grade Separations	08	RIV	OFF	Third St. Grade Sep	In Riverside on Third Street: replace existing 4 lane (2 in each direction) r/r/ x-ing with a 4-ln (2 lns in each direction - non-capacity) U.C. grade separation on Third St between Vine St and Park Ave	$45,000	X	X	X	X	X		X
LAIE_259	Los Angeles / Inland Empire	Grade Separations	08	RIV	OFF	Jackson St. Grade Sep	Jackson St (Riverside) - construct roadway/rail grade separations	$1,500	X	X	X	X	X		X
LAIE_260	Los Angeles / Inland Empire	Grade Separations	08	RIV	OFF	Ethanac Rd. Grade Sep	On Ethanac Rd from Sherman Rd. to Matthews Rd.:Widen from 2 to 4 lanes including Grade Separation over BNSF RR (Grade Separation is not part of Grade Separation list and should remain in the arterial section).	$62,900	X	X	X	X	X		X
LAIE_261	Los Angeles / Inland Empire	Grade Separations	08	RIV	OFF	Menifee Rd. Grade Sep	On Menifee Rd. from SR 74 (Pinacate Rd) to Simpson Rd: Widen from 2 to 4 lanes including Grade Separation over RR (Grade Separation is not part of Grade Separation list and should remain in the arterial section).	$57,300	X	X	X	X	X		X
LAIE_262	Los Angeles / Inland Empire	Grade Separations	08	RIV	OFF	Pennsylvania Ave. Grade Sep	Pennsylvania Ave (Beaumont) - construct roadway/rail grade separations	$2,200	X	X	X	X	X		X
LAIE_263	Los Angeles / Inland Empire	Grade Separations	08	SBD	OFF	Mt. Verson Ave. / BNSF Grade Sep	Mt. Vernon Avenue Bridge (overhead) at BNSF Crossing. Replace Grade Separation with new 4 lane bridge from 2nd St to 5th St (0.2 miles south of Route 66) (Bridge No 54C0066) (City of San Bernardino)	$145,400	X	X	X	X	X		X
LAIE_264	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	57	SR 57/SR 60 Interchange improvements	Route 57/60 confluence chokepoint relief program. Reconstruct Grand Avenue overcrossing. Reconstruct northbound SR 57 connector to eastbound SR 60. Construct eastbound SR 60 bypass off-ramp to Grand Avenue. Construct southbound Grand Avenue loop entrance ramp to eastbound SR 60. Construct Grand Avenue to eastbound SR 60 entrance ramp. Reconstruct the diamond bar golf course tunnel and golf course. Reconstruct Diamond Bar Boulevard entrance ramp to eastbound SR 60.	$420,000	X	X	X		X	X	X
LAIE_265	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	60	SR 60/7th Avenue (I-605 Hot Spot Studies)	Interchange Improvement Project	$23,100	X	X	X		X	X	X
LAIE_266	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	71	Route 71: Route 10 to San Bernardino county line (Mission Road to I-10 segment) - expressway to freeway conversion - add 1 HOV lane and 1 mixed flow lane. (2001 CFP 8349, TCRP #50) (EA# 210600, PPNO 2741) (TCRP #50).	Route 71: Route 10 to San Bernardino county line (Mission Road to I-10 segment) - expressway to freeway conversion - add 1 HOV lane and 1 mixed flow lane. (2001 CFP 8349, TCRP #50) (EA# 210600, PPNO 2741) (TCRP #50).	$305,800	X	X	X		X	X	
LAIE_267	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	91	SR 91 Interchange	SR 91 Wilmington Ave. interchange; proposed improvements would reconfigure Wilmington Ave. interchange to a modified DDI (diverging diamond interchange)	$49,000	X	X	X		X	X	X
LAIE_268	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	91	SR 91 Aux. Lane	EB SR 91 Atlantic Ave to Cherry Ave. Add one eastbound auxiliary lane from I-710 ramps at Atlantic Avenue to past Cherry Avenue undercrossing.	$90,000	X	X	X		X	X	X

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LAIE_269	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	91	SR 91 Interchange	SR 91 Central Ave interchange improvements. proposed improvements would reconfigure Central Ave. interchange to a modified DDI (diverging diamond interchange)	$49,000	X	X	X		X	X	X
LAIE_270	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	91	SR 91 WB Operational and Capacity Improvements	Improvements to the westbound SR 91 improvements project consist of adding an additional general purpose lane, adding auxiliary lanes, and on/off ramp improvements.	$187,800	X	X	X		X	X	
LAIE_271	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	91	Add auxiliary lane between gore points, westbound from Acacia Avenue to Central Avenue	Add auxiliary lane between gore points, westbound from Acacia Avenue to Central Avenue	$180,000	X	X	X		X	X	
LAIE_272	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	405	I-405 Aux	Add auxiliary lanes along I-405 northbound and southbound between Artesia Blvd and El Segundo to alleviate congestion and improve operations.	$108,000	X	X	X		X	X	X
LAIE_273	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	605	I-605 City of Industry	I-605 Valley Blvd interchange improvements: the project involves the reconfiguration of SB I-605 ramp by removing the horseshoe on-ramp and adding two lanes to the on-ramp. The project will also reconstruct the SB I-605 loop off and on-ramps. Lastly, the project will add a WB through lane on Valley Blvd west of Temple Ave and add a two lane left turn pocket for SB I-605 on-ramp on WB Valley Blvd.	$21,000	X	X	X		X	X	X
LAIE_274	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	605	I-605 South Street	SR I-605 at south street improvements project; proposed improvements on the I-605 connector South St. off ramp by adding storage capacity.	$36,000	X	X	X		X	X	X
LAIE_275	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	605	I-605 Interchange	SB I-605 loop on and off ramp removal and reconfiguration of the existing interchange at Beverly Blvd. The southbound I-605 collector-distributor road will be removed from the mainline and the new ramps will merge/diverge directly from the mainline.	$25,600	X	X	X		X	X	X
LAIE_276	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	605	This is an I-605 hot spot related intersection project. The purpose of this project is to replace/adjust 2 signals for the timing, alleviate the congestion and delays.	This is an I-605 hot spot related intersection project. The purpose of this project is to replace/adjust 2 signals for the timing, alleviate the congestion and delays.	$500	X	X	X		X	X	
LAIE_277	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	710	I-710	I-710 corridor capacity enhancement - add 1 mixed flow lanes between Ocean Blvd and SR 1 (each direction), add 2 truck lanes between Willow St and Del Amo Blvd (each direction), add 1 mixed flow lanes between I-105 and SR 60 (each direction), and interchange improvements between Ocean Blvd in Long Beach and SR 60 in east Los Angeles	$5,941,000	X	X	X	X	X	X	X
LAIE_278	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	OFF	Enhance goods movement by increasing turning radii, upgrading signals, adding lighting & signage, removing old railroad tracks, improving storm drains, & eliminating hazards. NOTE: This project is a City of Los Angeles project.	Enhance goods movement by increasing turning radii, upgrading signals, adding lighting & signage, removing old railroad tracks, improving storm drains, & eliminating hazards. This project is subject to Metro's EIR yet-to-be-determined preferred alternative for West Santa Ana Rail project. Metro expects to complete the Final EIR in 2022.	$12,027	X	X	X		X	X	
LAIE_279	Los Angeles / Inland Empire	Inter/Intra-state	07	LA	OFF	I-605	This project is an I-605 hot spot related intersection project. The purpose of this project is to increase the left-turn storage capacity, alleviate the congestion and delays.	$500	X	X	X		X	X	
LAIE_280	Los Angeles / Inland Empire	Inter/Intra-state	08	RIV	10	I-10 Truck Parking Availability Systems proejct	I-10 Truck Parking Availability Systems project is a collaboration with Texas, New Mexico, and Arizona to install dynamic truck parking signage along the I-10 corridor to inform truck drivers of available parking spaces in advance of reaching rest areas. The following locations within California will be installed with dynamic truck parking signage: • Wiley's Well Rest Area, • Cactus City Rest Area, • Whitewater Rest Area. • Wildwood Rest Area	$1,440	X	X	X	X	X	X	X

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LAIE_281	Los Angeles / Inland Empire	Inter/Intra-state	08	RIV	86	Widen and construct new 6 through lane IC from east of Coachella Stormwater Channel bridge to east of Tyler St	Widen and construct new 6 through lane IC from east of Coachella Stormwater Channel bridge to east of Tyler St. Improvements include extended ramp acceleration/deceleration lanes, relocate/realign ave 50 and Tyler St, bike lanes, sidewalks, and reconstruct traffic signals. Additionally this project will mitigate flooding issues.	$32,200	X	X	X	X	X		X
LAIE_282	Los Angeles / Inland Empire	Inter/Intra-state	08	RIV	86	Widen and construct new 6 through lane IC from east of Coachella Stormwater Channel Bridge to east of Tyler St.	At SR 86/Avenue 52: widen and construct new 6 through lane I/C from e/o Coachella Stormwater Channel bridge to e/o Tyler St. improvements include: realign Polk St and relocate Ave 52 and Polk St intersection, extended ramp acceleration/deceleration lanes, bike lanes, sidewalks, and reconstruct traffic signals (EA: 0c960). Additionally this project will mitigate flooding issues.	$33,000	X	X	X	X	X		X
LAIE_283	Los Angeles / Inland Empire	Inter/Intra-state	08	RIV	91	SR 91/SR 71	At SR 91/SR 71 JCT: Replace EB 91 to NB 71 connector w/direct connector and reconstruct the Green River Road EB on-ramp (EA: 0F541)	$127,000	X	X	X				
LAIE_284	Los Angeles / Inland Empire	Inter/Intra-state	08	RIV	91	Construct 1 LN westbound from Green River Road to SR 241	Construct 1 LN westbound from Green River Road to SR 241	$50,000	X				X		
LAIE_285	Los Angeles / Inland Empire	Inter/Intra-state	08	RIV	OFF	In western Riverside County in March IPA area - construct new extension of Van Buren Blvd from March Field Air Museum to Nandina Ave with 4 lane arterial with center turn median.	In western Riverside County in March IPA area - construct new extension of Van Buren Blvd from March Field Air Museum to Nandina Ave with 4 lane arterial with center turn median. March airfield includes a general aviation terminal and Amazon shipping terminal.	$8,800	X	X					X
LAIE_286	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	10	I-10 Eastbound truck climbing lane	I-10 EB truck climbing lane: continue the existing eastbound truck climbing lane on I-10 from the 16th St bridge in the city of Yucaipa for about 3 miles to just east of the county line road undercrossing. The project includes a transition lane to allow trucks to merge with general traffic and may include minor structural improvements to accommodate for lane widening (PPNO 3009q)	$34,600	X	X	X	X	X		X
LAIE_287	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	10	Accelerated Freight Bridges	Accelerated Freight Bridges Project (EA 1J210): • Investigation of six bridges along I-10 and SR 60 within San Bernardino and Riverside Counties for needs to strengthen/replace bridges or rehabilitate decks. • Upon inspection, Ramona Avenue OC (Bridge #54-0745) at SBD-60-PM R1.37 will need to be addressed. *This project is part of a larger project that includes D7's accelerated freight bridges at various locations along SR 60 within Los Angeles County.	$27,500	X	X		X	X	X	X
LAIE_288	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	10	I-10 corridor express lane widening (contract 1): from San Antonio Ave to I-10/I-15 IC; implement 2 express lanes in each direction for a total of 4 general purpose and 2 express lanes in each direction and aux lane widening, undercrossings, overcrossings, and reconstruction of ramps and lane transitions where needed.	I-10 corridor express lane widening (contract 1): from San Antonio Ave to I-10/I-15 IC; implement 2 express lanes in each direction for a total of 4 general purpose and 2 express lanes in each direction and aux lane widening, undercrossings, overcrossings, and reconstruction of ramps and lane transitions where needed.	$690,600	X	X	X	X			X

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									Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
LAIE_289	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	10	Colton: Mt. Vernon Ave Bridge widening over I-10: Widen Mt. Vernon Bridge structure (3-4 lanes; 1 new SB lane) to accommodate new dedicated turn and bike lanes, widen Mt. Vernon Ave (2-4 lanes) from I-10 EB off/on-ramps to approx. 300 FT south along Mt. Vernon; realign Mt. Vernon & E Valley Blvd Intersection; Relocate WB on-ramp (remains 1 lane at the mainline).	Colton: Mt. Vernon Ave Bridge widening over I-10: Widen Mt. Vernon Bridge structure (3-4 lanes; 1 new SB lane) to accommodate new dedicated turn and bike lanes, widen Mt. Vernon Ave (2-4 lanes) from I-10 EB off/on-ramps to approx. 300 FT south along Mt. Vernon; realign Mt. Vernon & E Valley Blvd Intersection; Relocate WB on-ramp (remains 1 lane at the mainline).	$53,800	X	X	X	X	X		X
LAIE_290	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	10	I-10 at Cedar Ave. between Slover and Bloomington - From Bloomington to Orange, reconstruct IC - Widen 4-6 lanes with left and right turn lanes; Add 1 lane to the EB off ramp which goes beyond the gore area; Add 2 lanes on the WB off ramp within the gore area; Pavement rehab From Orange to Slover (remains 4 lanes).	I-10 at Cedar Ave. between Slover and Bloomington - From Bloomington to Orange, reconstruct IC - Widen 4-6 lanes with left and right turn lanes; Add 1 lane to the EB off ramp which goes beyond the gore area; Add 2 lanes on the WB off ramp within the gore area; Pavement rehab From Orange to Slover (remains 4 lanes).	$79,200	X	X	X	X			
LAIE_291	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	15	I-15 express lanes: construct 2 new express lanes in each direction b/w SR 60 & SR 210, construct 1 express ln in each direction b/w Cantu-Galleano Ranch Rd & SR 60 and 1 express ln in each direction b/w SR 210 and Duncan Canyon Rd. Additional improvements to aux ln widening, undercrossings, and reconstruction of ramps and lane transitions where needed.	I-15 express lanes: construct 2 new express lanes in each direction b/w SR 60 & SR 210, construct 1 express ln in each direction b/w Cantu-Galleano Ranch Rd & SR 60 and 1 express ln in each direction b/w SR 210 and Duncan Canyon Rd. Additional improvements to aux ln widening, undercrossings, and reconstruction of ramps and lane transitions where needed.	$476,600	X	X	X	X			X
LAIE_292	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	60	Ramp improvements and local road improvements	SR 60 at Archibald Avenue; widen WB and EB entry ramps (add 1 lane), widen WB and EB exit ramps (add left turn lane), add additional left turn lane from Archibald Ave to SR 60 entry ramps. (non-capacity enhancing along Archibald).	$14,600	X	X	X	X			
LAIE_293	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	60	Grove Ave IC	Interchange reconstruction and Grove Ave +/- 300 feet N/S of SR 60 widen from 4-6 lanes (PA&ED Only)	$7,600	X	X	X	X			X
LAIE_294	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	138	Gap Closure in 4-Lane Facility on an Alternate Goods Movement Corridor (STAA Route)	1-Mile Gap Closure at and near BNSF Bridges, on an Alternate Goods Movement Route (STAA Route): SBD-138-PM 14.2/15.2 • Close a 1-mile long gap (which includes 2 BNSF bridges) where the 4-lane highway reduces to 2 lanes, creating a bottleneck for freight and passenger vehicles on this route. This project will mitigate head on collisions caused by passing slower vehicles. Note: These two SR 138 projects combined will complete a consistent 4-lane corridor for the entire route.	$25,000	X	X			X		

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LAIE_295	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	138	138 Gap Closure	2-Mile Gap Closure, on an Alternate Goods Movement Route (STAA Route), between Phelan Road and San Bernardino/Los Angeles County Line: SBD-138-PM 0.0/2.4 • Close a 2.4-mile gap of SR 138 where the 4-lane highway reduces to 2 lanes.This project will mitigate head on collisions caused by passing slower vehicles. Note: These two SR 138 projects combined will complete a consistent 4-lane corridor for the entire route.	$26,000	X	X			X		
LAIE_296	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	210	SR 210/5th St IC Improvements: Widen & restripe 5th St (4-6 lanes) from east edge of City Creek Bridge to the EB SR 210 ramps w/additional turn pockets plus 2 truck access lanes; Widen & restripe 5th St (6-8 lanes) under SR 210 b/w EB & WB ramps, incl. additional thru & turn lanes; Widen the EB & WB on-ramps 2-3 lanes, widen the EB & WB off-ramps 1-2 lanes, all ramps remain 1 ln at the mainline. (Combines prior projects 2011153 & 2011154)	SR 210/5th St IC Improvements: Widen & restripe 5th St (4-6 lanes) from east edge of City Creek Bridge to the EB SR 210 ramps w/additional turn pockets plus 2 truck access lanes; Widen & restripe 5th St (6-8 lanes) under SR 210 b/w EB & WB ramps, incl. additional thru & turn lanes; Widen the EB & WB on-ramps 2-3 lanes, widen the EB & WB off-ramps 1-2 lanes, all ramps remain 1 ln at the mainline. (Combines prior projects 2011153 & 2011154)	$9,700	X	X	X	X			
LAIE_297	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	395	U.S. 395 (Hesperia, Victorville, & Adelanto) from Chamberlaine Way to 1.8 mi s/o Desert Flower Road -interim widening-widen from 2-4 lanes and add left turn channelization at intersections (EA 0f632 | phase ii | SEQ 9)	U.S. 395 (Hesperia, Victorville, & Adelanto) from Chamberlaine Way to 1.8 mi s/o Desert Flower Road -interim widening-widen from 2-4 lanes and add left turn channelization at intersections (EA 0f632 | phase ii | SEQ 9)	$24,000	X	X			X		
LAIE_298	Los Angeles / Inland Empire	Inter/Intra-state	08	SBD	OFF	GREEN TREE BLVD EXTENSION	GREEN TREE BLVD AT AT&SF RAILROAD CONSTRUCT 4-LANE BR & CONNECT TO HESPERIA & RIDGECREST RD	$41,500	X	X	X	X	X		X
LAIE_299	Los Angeles / Inland Empire	Inter/Intra-state	08	Various	VAR	Last Mile Freight Pilot Initiatives	Last Mile Freight Pilot Initiatives	$5,000	X	X	X	X	X	X	X
LAIE_300	Los Angeles / Inland Empire	Inter/Intra-state	12	ORA	5	I-5 Add MF Lane	I-5 (I-405 to SR 55) - in the cities of Irvine and Tustin. Add 1 MF lane NB from truck bypass on ramp to SR 55, add 1 MF lane SB from SR 55 to Alton; improving merging. (project b)	$457,000	X						X
LAIE_301	Los Angeles / Inland Empire	Inter/Intra-state	12	ORA	55	SR 55 widening between I-405 and I-5	SR 55 widening between I-405 and I-5 - add 1 MF and 1 HOV lane each direction and fix chokepoints from I-405 to I-5; add 1 aux lane each direction between select on/off ramp and non-capacity operational improvements through project limits	$410,900	X						X
NC_302	Northern California	Inter/Intra-state	01	LAK	29	Lake 29 Widening and Truck Lane	Lake 29 Widening and Truck Lane	$94,000	X	X		X	X		X
NC_303	Northern California	Inter/Intra-state	02	SHA	5	I-5 Big & Tall (Accl'd Freight Bridge)	Remove vertical clearance and load carrying capacity restrictions along mainline I-5	$39,249			X	X	X		X
NC_304	Northern California	Inter/Intra-state	02	SHA	5	Fix 5 Cascade Gateway	In Shasta County, in Redding, from 0.3 miles north of Cypress Ave OC to north of Oasis Rd OC, incorporate changeable / movable lanes to enhance freight safety and mobility.	$94,965	X				X		X
NC_305	Northern California	Inter/Intra-state	03	NEV	20	Repair distressed pavement; replace culverts and sign panels; repair/upgrade existing curb ramps, replace TMS elements (4H070)	Repair distressed pavement; replace culverts and sign panels; repair/upgrade existing curb ramps, replace TMS elements (4H070)	$29,700	X	X			X	X	X

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NC_306	Northern California	Inter/Intra-state	03	NEV	49	SR 49 Corridor improvement project in Nevada County from 0.1 mile north of La Barr Meadows Road to McKnight Way construct NB truck climbing lane. (3H510)	SR 49 Corridor improvement project in Nevada County from 0.1 mile north of La Barr Meadows Road to McKnight Way construct NB truck climbing lane. (3H510)	$77,700	X	X	X	X	X	X	X
NC_307	Northern California	Inter/Intra-state	03	NEV	80	Yuba Pass SOH Bridge Replacement. I-80 near Emigrant Gap: Replace bridges, widen WB direction for truck climbing lane, install TMS elements (2020 SHOPP) (3H560)	Yuba Pass SOH Bridge Replacement. I-80 near Emigrant Gap: Replace bridges, widen WB direction for truck climbing lane, install TMS elements (2020 SHOPP) (3H560)	$84,000	X	X	X	X	X	X	X
NC_308	Northern California	Inter/Intra-state	03	NEV	80	In Placer County near Soda Springs from Troy Road Undercrossing to Nevada County line. Roadway Rehabilitation and Truck Climbing Lanes. (EA 1H990) 0317000043 In Placer County near Soda Springs from Troy Road Undercrossing to Nevada County line. Roadway Rehabilitation and Truck Climbing Lanes. (EA 1H990)	In Placer County near Soda Springs from Troy Road Undercrossing to Nevada County line. Roadway Rehabilitation and Truck Climbing Lanes. (EA 1H990) 0317000043 In Placer County near Soda Springs from Troy Road Undercrossing to Nevada County line. Roadway Rehabilitation and Truck Climbing Lanes. (EA 1H990)	$93,000	X	X	X	X	X	X	X
NC_309	Northern California	Inter/Intra-state	03	YUB	70	Near Marysville, from Laurellen Road to South Honcut Creek Bridge (#16-0020) - Widen shoulders and improve clear recovery zone [PM 16.2/25.8] (Toll credits for PE, ROW, CON). Toll Credits for ENG, ROW, CON; add continuous a two-way left turn lane (TWLTL) throughout the project; 2 separate passing lanes are planned in each direction. Each one is less than a mile in length (PM 16.2/25.8); overlay with RHMA; replace and extend culverts; install TMS elements, fiber optic system elements, and lighting intersection; and install a classification station (CAL20679)	Near Marysville, from Laurellen Road to South Honcut Creek Bridge (#16-0020) - Widen shoulders and improve clear recovery zone [PM 16.2/25.8] (Toll credits for PE, ROW, CON). Toll Credits for ENG, ROW, CON; add continuous a two-way left turn lane (TWLTL) throughout the project; 2 separate passing lanes are planned in each direction. Each one is less than a mile in length (PM 16.2/25.8); overlay with RHMA; replace and extend culverts; install TMS elements, fiber optic system elements, and lighting intersection; and install a classification station (CAL20679)	$104,640	X	X			X	X	X
SDIC_310	San Diego - Imperial County Border	Port Access	11	IMP	7	Calexico East Port of Entry Truck Crossing Improvement	Expansion of the Calexico East Port of Entry- widen bridge over the All-American Canal (canal serves at U.S./Mexico border) and increase the number of commercial vehicle lanes from existing 3 to 6 lanes; add 6 new northbound privately owned vehicle (POV) lane; pedestrian pathway improvements including shaded sidewalks and transit lot (pick-up and drop-off area)	$100,000	X	X					X
SDIC_311	San Diego - Imperial County Border	Port Access	11	IMP	7	Calexico East Port of Entry Bridge expansion	Calexico East Port of Entry Bridge expansion	$30,000		X	X	X		X	X

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SDIC_312	San Diego - Imperial County Border	Port Access	11	IMP	98	Widen SR 98 between Dogwood Road and V.V. Williams Ave.	Widen SR 98 between Dogwood Road and V.V. Williams Ave.	$50,000		X			X	X	X
SDIC_313	San Diego - Imperial County Border	Port Access	11	IMP	98	Widen SR 98 between Ollie Ave. and Rockwood Dr.	Widen SR 98 between Ollie Ave. and Rockwood Dr.	$11,000		X			X	X	X
SDIC_314	San Diego - Imperial County Border	Port Access	11	IMP	186	Bridge and highway realignment to Andrade POE	Bridge and highway realignment to Andrade POE	$40,000		X	X	X	X	X	X
SDIC_315	San Diego - Imperial County Border	Port Access	11	IMP	OFF	Calexico East Port of Entry Commercial Vehicle Enforcement Facility (CVEF) modernization: Improvements to the CVEF	Calexico East Port of Entry Commercial Vehicle Enforcement Facility (CVEF) modernization: Improvements to the CVEF	$30,000		X	X		X	X	
SDIC_316	San Diego - Imperial County Border	Port Access	11	IMP	OFF	Menvielle Road Widening - Widen to four lanes, from Carr Road to SR 98	Menvielle Road Widening - Widen to four lanes, from Carr Road to SR 98	$50,000		X	X		X	X	X
SDIC_317	San Diego - Imperial County Border	Port Access	11	SD	11	Construct the Otay Mesa East Port of Entry and CVEF	SR 11 Segment 3 (Land Port of Entry) location, from existing SR 11 to future Otay Mesa East POE	$380,000	X	X	X	X	X	X	X
SDIC_318	San Diego - Imperial County Border	Port Access	11	SD	15	Vesta Bridge Phase 1 and operational improvements SR 15, Main, Harbor, and 32nd Streets	Vesta Bridge Phase 1 and operational improvements SR 15, Main, Harbor, and 32nd Streets	$54,000		X			X	X	X
SDIC_319	San Diego - Imperial County Border	Port Access	11	SD	905	Otay Mesa Port of Entry Commercial Vehicle Enforcement Facility (CVEF) modernization: Improvements to the CVEF to reflect GSA's proposed Otay Mesa POE Modernization Project	Otay Mesa Port of Entry Commercial Vehicle Enforcement Facility (CVEF) modernization: Improvements to the CVEF to reflect GSA's proposed Otay Mesa POE Modernization Project	$50,000		X	X	X	X	X	X
SDIC_320	San Diego - Imperial County Border	Port Access	11	SD	OFF	Border Wait Times - Install the remaining border wait times equipment (northbound) at all CA-BC land POEs, SR 11 tolling equipment, and Regional Border Management System	Border Wait Times - Install the remaining border wait times equipment (northbound) at all CA-BC land POEs, SR 11 tolling equipment, and Regional Border Management System	$50,000	X	X	X	X	X		X
SDIC_321	San Diego - Imperial County Border	Port Access	11	SD	OFF	Otay Mesa Truck Route Phase 4	Otay Mesa Truck Route Phase 4	$14,600		X		X	X	X	X
SDIC_322	San Diego - Imperial County Border	Port Access	11	SD	OFF	La Media Road North	La Media Road North	$50,000	X	X			X	X	X
SDIC_323	San Diego - Imperial County Border	Port Access	11	SD	OFF	Tenth Avenue Marine Terminal Optimization Project	Tenth Avenue Marine Terminal Optimization Project	$38,000	X	X	X	X		X	X

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SDIC_324	San Diego - Imperial County Border	Port Access	11	SD	OFF	Bridge between OM POE and CVEF to coincide with improvements at both facilities	Bridge between OM POE and CVEF to coincide with improvements at both facilities	$50,000		X			X	X	X
SDIC_325	San Diego - Imperial County Border	Port Access	11	SD	OFF	Appointment systems and truck excess weight program at POEs	Appointment systems and truck excess weight program at POEs	$30,000					X	X	
SDIC_326	San Diego - Imperial County Border	Port Access	11	SD	OFF	National City Marine Terminal rail improvements and electrical and other infrastructure and equipment	National City Marine Terminal rail improvements and electrical and other infrastructure and equipment	$15,000	X	X	X	X		X	X
SDIC_327	San Diego - Imperial County Border	Port Access	11	SD	OFF	Designated Freight Route: Dedicated lanes (where feasible) and signal priority for truck freight along Harbor Drive between TAMT/Cesar Chavez Pkwy, NCMT and connections to I-5. Includes expansion of Port Tenants' freight signal prioritization project (FSP), queue jumps, delineators and signage. Generally aligned in the #1 lanes and median	Designated Freight Route: Dedicated lanes (where feasible) and signal priority for truck freight along Harbor Drive between TAMT/Cesar Chavez Pkwy, NCMT and connections to I-5. Includes expansion of Port Tenants' freight signal prioritization project (FSP), queue jumps, delineators and signage. Generally aligned in the #1 lanes and median	$50,000	X	X	X	X	X		X
SDIC_328	San Diego - Imperial County Border	Port Access	11	SD	OFF	Truck Parking Information Management System: Resource for tenants and truck operators to obtain information and potentially reserve parking resources. Could be tied to Port Freight Community Web Portal.	Truck Parking Information Management System: Resource for tenants and truck operators to obtain information and potentially reserve parking resources. Could be tied to Port Freight Community Web Portal.	$10,000		X	X	X	X	X	
SDIC_329	San Diego - Imperial County Border	Port Access	11	SD	OFF	Vesta Bridge - Phases 2 and 3	Vesta Bridge - Phases 2 and 3	$97,934					X	X	
SDIC_330	San Diego - Imperial County Border	Port Access	11	SD	OFF	SDIA Interior Northside Roadway	SDIA Interior Northside Roadway	$5,000	X				X		
SDIC_331	San Diego - Imperial County Border	Port Access	11	SD	OFF	SDIA Air Cargo Facility Improvements for cargo storage and handling	SDIA Air Cargo Facility Improvements for cargo storage and handling	$27,000	X					X	
SDIC_332	San Diego - Imperial County Border	Port Access	11	SD	VAR	I-5 Working Waterfront Access Bottleneck Relief between SR 15 and SR 54	I-5 Working Waterfront Access Bottleneck Relief between SR 15 and SR 54	$30,000		X			X	X	X
SDIC_333	San Diego - Imperial County Border	Port Access	11	SD	VAR	I-8, SR 98, SR 111 Operational improvements including ITS equipment for truck routing	Operational improvements including ITS equipment for truck routing	$10,000		X	X	X	X	X	X

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SDIC_334	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	Batiquitos Lagoon Double Track	The project will add .75 miles of second mainline rail track from Avenida Encinas in Carlsbad to La Costa Avenue in Encinitas across the Batiquitos Lagoon. The project also includes replacing a wooden trestle bridge, built in the 1930s, with a modern, double-track concrete rail bridge. Location: Between Avenida Encinas in Carlsbad and La Costa Avenue in Encinitas	$95,700	X	X	X	X	X	X	X
SDIC_335	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	San Onofre-Pulgas Phase 2	The addition of 5.8 miles of second mainline rail track will be added to the main line. In addition, the project also includes the replacement of two rail bridges, the addition of a universal track crossover, and new signaling. Location between San Onofre and Pulgas	$30,000	X	X	X	X	X		
SDIC_336	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN Signal Respacing and Optimization Improvements	LOSSAN Signal Respacing and Optimization Improvements	$16,304	X	X	X		X	X	
SDIC_337	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN Del Mar Bluffs Stabilization	LOSSAN Del Mar Bluffs Stabilization	$70,000	X	X	X		X	X	
SDIC_338	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN San Onofre Bridge Replacements	LOSSAN San Onofre Bridge Replacements	$46,700	X	X	X		X	X	
SDIC_339	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN Rose Canyon Bridge Replacements	LOSSAN Rose Canyon Bridge Replacements	$14,200	X	X	X		X	X	
SDIC_340	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN Sorrento to Miramar Double Track/Realign: Realign curve and construct second main track	LOSSAN Sorrento to Miramar Double Track/Realign: Realign curve and construct second main track	$135,000	X	X	X		X	X	
SDIC_341	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN North Green Beach Bridge	LOSSAN North Green Beach Bridge	$7,200	X	X	X		X	X	
SDIC_342	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN Poinsettia Crossovers	LOSSAN Poinsettia Crossovers	$32,300	X	X	X		X	X	
SDIC_343	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN Sorrento Valley Blvd Safety Improvements	LOSSAN Sorrento Valley Blvd Safety Improvements	$3,897	X	X	X		X	X	
SDIC_344	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN Sorrento Valley Crossover and Safety Improvements	LOSSAN Sorrento Valley Crossover and Safety Improvements	$32,800	X	X	X		X	X	
SDIC_345	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN Eastbrook to Shell Double Track (San Luis River Bridge)	LOSSAN Eastbrook to Shell Double Track (San Luis River Bridge)	$75,300	X	X	X		X	X	
SDIC_346	San Diego - Imperial County Border	Rail Systems	11	SD	OFF	LOSSAN San Dieguito Double Track (includes Del Mar Platform)	LOSSAN San Dieguito Double Track (includes Del Mar Platform)	$211,000	X	X	X		X	X	

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									Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
SDIC_347	San Diego - Imperial County Border	Inter/Intra-state	11	IMP	115	New Truck Route and Four lane Expressway from I-8/SR 7 to existing SR 115, Holtville CA	New Truck Route and Four lane Expressway from I-8/SR 7 to existing SR 115, Holtville CA	$250,000	X	X	X	X	X		X
SDIC_348	San Diego - Imperial County Border	Inter/Intra-state	11	IMP	OFF	Forester Road: Operational Improvements, Bridge Reconstruction over New River, and Four Lane Expressway	Operational Improvements, Bridge Reconstruction over New River, and Four Lane Expressway (Truck bypass)	$300,000		X	X	X	X	X	X
SDIC_349	San Diego - Imperial County Border	Inter/Intra-state	11	SD	5	North Coast Corridor: Construct managed lanes (ML) between Palomar Airport Road and SR 78 with ITS improvements	North Coast Corridor: Construct managed lanes (ML) between Palomar Airport Road and SR 78 with ITS improvements	$240,000		X	X	X	X	X	
SDIC_350	San Diego - Imperial County Border	Inter/Intra-state	11	SD	5	I-5 ML from SR 78 to Orange County with ITS improvements, including vehicle-to-infrastructure technology along key corridors	I-5 ML from SR 78 to Orange County with ITS improvements, including vehicle-to-infrastructure technology along key corridors	$3,400,483		X	X	X	X	X	
SDIC_351	San Diego - Imperial County Border	Inter/Intra-state	11	SD	5	I-5 ML from La Jolla Village Dr to I-5/I-805 merge with ITS improvements including vehicle-to-infrastructure technology	I-5 ML from La Jolla Village Dr to I-5/I-805 merge with ITS improvements including vehicle-to-infrastructure technology	$280,200		X	X	X	X	X	
SDIC_352	San Diego - Imperial County Border	Inter/Intra-state	11	SD	5	Congestion pricing on I-5 from I-805 to SR 78	Congestion pricing on I-5 from I-805 to SR 78	$130,000			X	X	X	X	
SDIC_353	San Diego - Imperial County Border	Inter/Intra-state	11	SD	5	Alternative Fuel Corridor from Orange County border to MX border	Alternative Fuel Corridor from Orange County border to MX border	TBD	X	X	X	X	X		
SDIC_354	San Diego - Imperial County Border	Inter/Intra-state	11	SD	8	Alternative Fuel Corridor from San Diego to CA/AZ border	Alternative Fuel Corridor from San Diego to CA/AZ border	TBD		X	X	X	X		
SDIC_355	San Diego - Imperial County Border	Inter/Intra-state	11	SD	15	Alternative Fuel Corridor	Alternative Fuel Corridor	TBD	X	X	X	X	X		
SDIC_356	San Diego - Imperial County Border	Inter/Intra-state	11	SD	15	I-15 ML from I-805 to SR 163 with Clairemont Mesa Blvd DAR with vehicle-to-infrastructure technology	I-15 ML from I-805 to SR 163 with Clairemont Mesa Blvd DAR with vehicle-to-infrastructure technology	$82,000		X	X	X	X	X	
SDIC_357	San Diego - Imperial County Border	Inter/Intra-state	11	SD	78	Alternative Fuel Corridor from I-5 interchange to I-15 interchange	Alternative Fuel Corridor from I-5 interchange to I-15 interchange	TBD		X	X	X	X		

The CFMP project list demonstrates alignment with the goals of the plan and not priority or commitment to future transportation funds.

Project Reference ID	CFMP Region	Project Category	District	County	Route	Project Name	Project Description	Cost (1,000 USD)	CFMP Goal Alignment						
									Multimodal Mobility	Economic Prosperity	Environmental Stewardship	Healthy Communities	Safety and Resiliency	Asset Management	Connectivity and Accessibility
SDIC_358	San Diego - Imperial County Border	Inter/Intra-state	11	SD	805	I-805 ML from I-15 to SR 52 including vehicle-to-infrastructure technology	I-805 ML from I-15 to SR 52 including vehicle-to-infrastructure technology	$800,000		X	X	X	X	X	
SDIC_359	San Diego - Imperial County Border	Inter/Intra-state	11	SD	805	I-805 ML from SR 94 to I-15 with connector including vehicle-to-infrastructure technology	I-805 ML from SR 94 to I-15 with connector including vehicle-to-infrastructure technology	$324,000		X	X	X	X	X	
SDIC_360	San Diego - Imperial County Border	Port Access	11	SD	OFF	Continuation of San Diego Port Tenants Assocation's Freight Signal Priotization project (California Energy Commission pilot)	Continuation of San Diego Port Tenants Assocation's Freight Signal Priotization project (California Energy Commission pilot)	$6,000		X		X	X	X	X
SDIC_361	San Diego - Imperial County Border	Inter/Intra-state	11	SD	VAR	Modernizing existing truck parking/staging areas for near-zero to zero infrastructure truck shore power - based on outcomes of Caltrans HQ truck parking study	Modernizing existing truck parking/staging areas for near-zero to zero infrastructure truck shore power - based on outcomes of Caltrans HQ truck parking study	$2,000		X	X	X		X	
SDIC_362	San Diego - Imperial County Border	Inter/Intra-state	11	SD	VAR	New dynamic truck parking/staging areas - based on outcomes of Caltrans HQ truck parking study	New dynamic truck parking/staging areas - based on outcomes of Caltrans HQ truck parking study	$40,000		X	X	X	X	X	

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