San Francisco Bay Area Goods Movement Plan

Draft Final Report

prepared for

Metropolitan Transportation Commission

prepared by

Cambridge Systematics, Inc.

February 2016

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date

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List of Acronyms

3PL	Third Party Logistics
ABAG	Association of Bay Area Governments
AMPP	Assistance for Major Projects Program
ARM	Adaptive Ramp Metering
ATM	Active Traffic Management
BAAQMD	Bay Area Air Quality Management District
BCO	Beneficial Cargo Owner
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCSCE	Center for Continuing Study of the California Economy
CMA	Congestion Management Agency
CMAQ	Congestion Mitigation and Air Quality
CREATE	Chicago Regional Environmental and Transportation Efficiency Program
CTC	County Transportation Commission
DPM	Diesel particulate matter
EIR	Environmental Impact Report
EDD	Employment Development Department
EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
FRATIS	Freight Advanced Traveler Information Systems
FY	Fiscal Year
GHG	Greenhouse Gas
GIS	Geographic Information System

HOV	High-Occupancy Vehicle
ITIP	Interregional Transportation Improvement Program
ITS	Intelligent Transportation Systems
JPA	Joint Powers Authority
JSOU	Joint Statement of Understanding
LA Metro	Los Angeles County Metropolitan Transportation Authority
LOS	Level of Service
LSP	Logistics Service Provider
MAPLA	Maritime and Aviation Project Labor Agreement
MOU	Memorandum of Understanding
MSIF	Mobile Source Incentive Fund
MTC	Metropolitan Transportation Commission
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NCTC	Northern California Trade Coalition
NHS	National Highway System
OAK	Oakland Army Base
OAK	Oakland International Airport
OBAG	One Bay Area Grant
OHIT	Outer Harbor Intermodal Terminal
P3	Public-Private Partnerships
PVI	Pollution Vulnerability Indices
R&D	Research and Development
ROI	Return on Investment
ROW	Right of Way

RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SACOG	Sacramento Council of Governments
SCAG	Southern California Association of Governments
SCS	Sustainable Communities Strategy
SFO	San Francisco International Airport
SJCOG	San Joaquin Council of Governments
STIP	State Transportation Improvement Program
STP	Regional Surface Transportation Program
STRRA	Surface Transportation Reauthorization and Reform Act
TAACCT	Trade Adjustment Assistance Community College Career Training
TEP	Transportation Expenditure Plan
TEU	Twenty-Foot Equivalent Unit
TCIF	Trade Corridors and Investment Fund
TFCA	Transportation Fund for Clean Air
TOL	Truck-Only-Lanes
VMT	Vehicle Miles Traveled
ZE	Zero Emission

1.0 Introduction

1.1 Background and Context

Goods movement has always played a critical role in the San Francisco Bay Area. The regional goods movement infrastructure includes the nation's fifth largest container port (the Port of Oakland) and several specialized seaports, two of the most active air cargo airports in the Western U.S. (San Francisco International Airport and Oakland International Airport), major rail lines and rail terminals, and highways that carry some of the highest volumes of trucks in California. This infrastructure also plays a central role for the Northern California mega-region. But as the Bay Area's economy and planning priorities have evolved, so too must its approach to considering goods movement's role in the regional transportation system. Some of the changes the region has experienced that will influence its approach to goods movement include:

- **Changes in industry mix and downward pressure on middle wage jobs.** The economy has shifted away from manufacturing and warehouse and distribution industries that dominated the goods movement picture in the last century and has moved towards technology and knowledge-based industries. This change in the economy has reduced opportunities for workers in middle-wage occupations with low educational barriers to entry.

- **Changes in land use development patterns and the location of goods distribution facilities.** The region was an early leader in promoting Smart Growth and new urban forms. In recent years there has been a growing focus on planning for compact development in Priority Development Areas adjacent to transit. This can create redevelopment pressure in older industrial centers, leading to conflicts between goods movement and passenger transportation modes on congested roadways and rail lines. As land values have risen, much of the region's distribution network for serving consumer demands has moved to the northern San Joaquin Valley and northern Nevada. This is exacerbating congestion and safety conditions on the region's interregional highways.

- **Urgency to address environmental justice issues while reducing greenhouse gas (GHG) emissions.** Along with the region's concern over housing affordability comes an overarching concern about equity in land use and transportation decisions. The region's major goods movement corridors and facilities tend to be concentrated in close proximity to communities which are disproportionally low income and/or communities of color where environmental justice concerns are significant. Continued investment in goods movement in these corridors must minimize impacts on these communities. At a broader level, the region continues to pursue strategies to address climate change and environmental sustainability goals as a core component of its transportation plans. This will require new approaches and new technologies for goods movement.

By developing creative solutions to address the opportunities and challenges associated with these changes in the region, the San Francisco Bay Area can frame a new vision of the role of

goods movement and can stake out a position of national leadership. This vision is for a goods movement program that:

- **Emphasizes the connection between goods movement and middle-wage job opportunities.** Goods movement activities can provide good paying, middle-wage jobs. By taking advantage of the unique opportunity to develop a world class logistics hub around the Port of Oakland and the former Oakland Army Base, the region can help replace some of the middle-income jobs that have been lost during the economic transformation that has occurred over the last 20 years. This strategy has benefits beyond the region, as the Bay Area remains a critical international and domestic trade hub for all of Northern California, Nevada, and Utah.

  There are also pockets of new industrial activity in the Bay Area – wine production and organic food production in the North Bay, advanced manufacturing and biotechnology in the East Bay, clean energy systems in the South Bay – that will support job diversity and will need access to a wide array of efficient goods movement services.

- **Relies on smarter operations, technology, and land use strategies to increase the efficiency of the goods movement system.** Future goods movement planning will need to emphasize efficiency, demand management, and multimodal approaches, similar to how the region now plans for its passenger system. Technology and "smart" operations will be at the center of future goods movement strategies. Freight intelligent transportation systems (ITS), "connected" vehicles, and zero and near-zero emission vehicles will be important elements of the future goods movement system in the Bay Area. This represents another public-private partnership opportunity to engage the region's innovation sectors in helping to bring these new technologies to the marketplace. Goods movement hubs and corridors in the region will continue to require attention to the equity implications of growth in goods movement activity. The goods movement plan addresses impacts on communities through strategies such as zero and near-zero emission technology, changes in land use and truck route planning, and improvements in goods movement efficiency.

- **Makes strategic investments to reduce congestion, improve reliability, and increase safety at international gateways and along primary travel corridors.** The region's seaports and airports continue to play an important role for businesses and consumers throughout Northern California and neighboring states. These facilities are often congested and inefficient. Connections to freight hubs via the region's major highway and rail corridors are also congested and in need of modernization. When making investments in these systems, the region will have limited resources and must invest strategically with an understanding of how demand patterns will continue to change and where public and private investments can be leveraged in order to achieve the greatest public benefits. Like the private sector has done in making decisions to rationalize private rail and trucking networks, the public sector must invest selectively and strategically.

This approach to goods movement planning seeks to bring goods movement strategies into fundamental alignment with the region's overall transportation, economic, equity, and environmental priorities. Rather than addressing goods movement priorities in isolation, the plan focuses on implementing these priorities within the overall structure of Plan Bay Area. While implementation may require new policies, institutional arrangements, and funding sources, this re-alignment of goods movement priorities represents a path forward that should allow the Bay Area to get the best that its goods movement system has to offer.

It is also important to note that unlike many other transportation programs undertaken in the Bay Area, a goods movement plan can only succeed with a high level of public-private, private-private, and public-public collaboration. Much of the goods movement system is owned and operated by the private sector. The public sector has limited control over the actions of these private goods movement stakeholders and can only accomplish public goals by working in partnership. The private goods movement system is owned and operated by an array of organizations including railroads, trucking companies, logistics service providers, shippers, and technology companies. The decision-making of these companies is often fragmented, and this can lead to inefficiencies that could be overcome with greater collaboration. Likewise, jurisdiction over the public elements of the goods movement system, including regulation of this system, involves different local, regional, state, and Federal agencies who must work together to pool resources and implement programs. The final section of this plan considers a number of options for how Metropolitan Transportation Commission (MTC) can work with all of these partners and foster the collaboration that will be necessary to realize the vision embodied in this plan.

1.2 Plan Development Approach and Purpose

It has been 10 years since the last goods movement plan for the region was developed. The MTC commissioned this update to the goods movement plan in order to support and underpin the upcoming Plan Bay Area 2040s approach to economic prosperity. Plan Bay Area 2040, scheduled for adoption in 2017, is the update to Plan Bay Area, the regional transportation plan (RTP) and sustainable communities strategy (SCS).

This updated MTC Goods Movement Plan outlines a long-range strategy for how to move goods effectively within, to, from and through the Bay Area by roads, rail, air and water. It provides specific strategies – projects, programs, and policies –focused on goods movement that will ultimately inform Plan Bay Area 2040. The Goods Movement Plan:

- Establishes a vision for the sustainable movement of freight and other goods to ensure the Bay Area continues to thrive across different industries and play a vital role in the California, national and global economy;
- Identifies strategies including infrastructure investments, policy changes and programs to address goods movement issues and realize goods movement system opportunities;
- Uses a series of performance measures consistent with the vision and goals to prioritize these strategies;

- Focuses the strategies on key opportunities for the region that take advantage of its unique characteristics; and

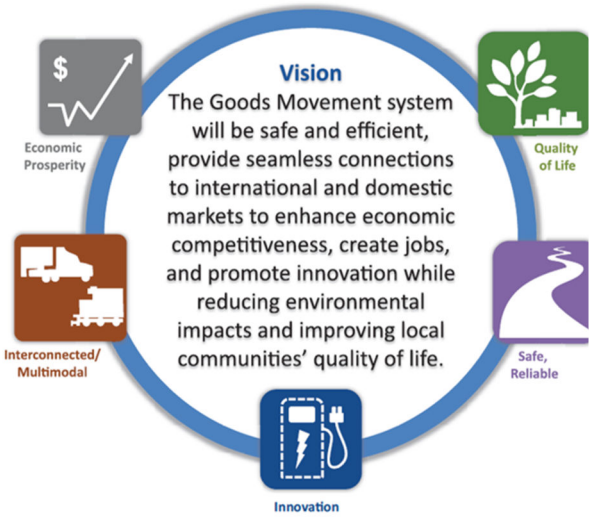
- Develops short- and long-term recommendations for how to work with partners throughout the Bay Area to advance the Plan and advocate for the policies and funding needed from state and Federal partners.

This update to the regional Goods Movement Plan benefited significantly from a parallel process commissioned by the Alameda County Transportation Commission (CTC) for their own Alameda County Goods Movement Plan. Much of the region's goods movement infrastructure is located in Alameda County and this made collaboration on this joint long-range plan development process crucially important as well as an ideal opportunity. Similarly, the congestion management agencies (CMA) for all of the counties across the Bay Area took advantage of this opportunity to examine their unique goods movement needs.

Stakeholder input was obtained through outreach to a variety of groups throughout the plan development process. The formal stakeholder engagement effort included an Executive Team, a regional technical advisory committee, interest groups, and public roundtables. The Executive Team consisted of executive leaders from MTC, Alameda CTC, Contra Costa Transportation Authority, Solano Transportation Authority, Valley Transportation Authority, the Port of Oakland, California Department of Transportation (Caltrans) District 4, the East Bay Economic Development Alliance, and the Bay Area Air Quality Management District (BAAQMD). The regional technical advisory committee and interest groups included staff from these same agencies, as well as stakeholders representing public health and environmental organizations, community and social justice groups, labor, and business interests, including shippers, carriers and logistics service providers.

The Regional Goods Movement Plan is intended to inform the upcoming Plan Bay Area 2040. Strategies were developed with an acknowledgment of regional transportation priorities and Plan Bay Area 2040's Goals and Targets, including the emphasis on GHG reduction, health, and equity goals. The Goods Movement Plan concludes with a section describing next steps that identifies existing funding opportunities that can be highlighted in Plan Bay Area, new funding programs that must be targets of advocacy, and new institutional arrangements, including public-private partnerships, that must be pursued in the future. The development of Plan Bay Area 2040 immediately subsequent to the regional Goods Movement Plan creates a fresh opportunity to take these ideas to the next level of planning and programming.

2.0 Challenges and a Vision for the Future



A critical part of developing the MTC Goods Movement Plan was the development of a vision statement and goals that respond to the challenges that the Bay Area faces as it seeks to realize the benefits that an efficient and sustainable goods movement system can provide. The region faces several tensions inherent in the interplay between our opportunities and challenges. For example, the goods movement system can provide many good middle-wage jobs, but the current housing crisis in the region hampers the ability of middle-income earners to live near these jobs and our educational and vocational training systems need to keep pace providing training programs to equip our region's workers for these jobs.

Likewise, freight's economic benefits must be balanced with environmental concerns. Environmental justice stakeholders and goods movement businesses can develop adversarial relationships or partnerships as the region pursues its goods movement vision amidst the many challenges it faces. This plan sought to gather input from many stakeholders so as to encourage a partnership approach that will identify shared goals and areas of compromise in developing the region's future goods movement system. Like many other places in the country, transformative changes in the goods movement sector here require public-private collaboration. Public-private collaboration can reap many benefits, but is not easy to do in the best of circumstances. Developing the right institutions to guide and foster this collaboration will be an important next step as the strategies in the Plan are implemented.

2.1 Goods Movement Goals and Challenges

2.1.1 Quality of Life

Goal: Reduce environmental and community impacts from goods movement operations to create healthy communities and a clean environment, and improve quality of life for those communities most impacted by goods movement.

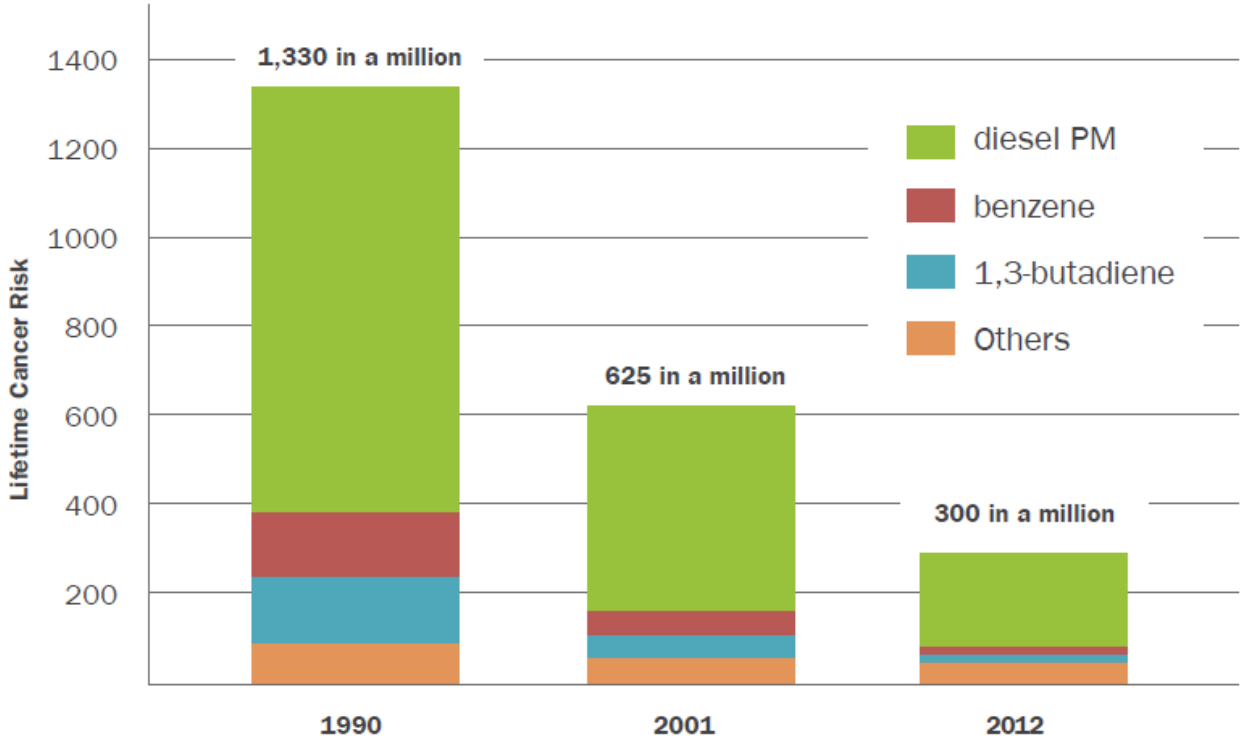
The Bay Area serves as a national leader in identifying and implementing strategies to improve public health by reducing air pollution and improving water quality, strategies to protect the environment and infrastructure by reducing GHGs, and preparing for sea-level rise and significant weather events.

Perhaps the most critical air quality and public health issues surrounding goods movement in Alameda County are related to impacts of goods movement-related emissions on the health

and safety of communities directly adjacent to major goods movement facilities and connecting infrastructure. These communities experience some of the highest exposure levels to pollution that causes asthma and other respiratory ailments, heart disease, and other health problems. These pollution sources include light and noise pollution that arose as a result of growing freight activities. While future planning efforts should look to create buffers between goods movement activity and neighborhoods wherever possible, this may be more difficult in some locations and may require new goods movement technologies or other measures such as building design to reduce exposure to public health risks.

Although the Bay Area does not yet attain all national and state standards for pollutants that cause health impacts, specifically particulate matter (PM), BAAQMD, and the California Air Resources Board (CARB) are actively seeking to reduce emissions from key sources.[1] Figure 2.1 shows that the region has seen a four-fold reduction in cancer risk due to air toxics over time: from 1,300 per million in 1990 to 300 per million in 2012.

Figure 2.1 Estimated Bay Area Lifetime Cancer Risk from Toxic Air Contaminants



Source: Improving Air Quality and Health in Bay Area Communities, Community Air Risk Evaluation Program Retrospective and Path Forward (2004 – 2013), BAAQMD, April 2014.

[1] Bay Area Air Quality Management District (BAAQMD), http://www.baaqmd.gov/Divisions/Planning-and-Research/Particulate-Matter.aspx#dpm.

Currently, CARB is developing a Sustainable Freight Strategy. The strategy is designed to reduce localized health risk near freight facilities, reach air quality standards, and reduce California's contributions to global climate change. One particularly innovative part of the development process will be technological assessments across transportation modes for ability to implement low-emission strategies.[2] In addition, MTC is conducting an assessment of regional opportunities to apply zero and near-zero emission technologies for goods movement. Information from these efforts have already been included in this plan wherever this information was available. In the future, as these other planning studies are completed, the relevant strategies contained in the Goods Movement Plan can be adapted to incorporate the latest and best information on technology and operating strategies that can help reduce impacts of goods movement on communities and the environment.

2.1.2 Safety and Reliability

Goal: Provide safe, reliable, efficient and well-maintained goods movement facilities.

The interregional and intraregional highway corridors of the in Alameda County carry the highest volumes of truck traffic. The high volumes of traffic, heterogeneous traffic mix, as well as frequent weaving and merging around interchanges, also create safety issues. There is a network of major arterial truck routes that provide an important function for urban goods delivery, particularly to retailers, commercial businesses, and residences. Inconsistencies such as size and weight restrictions or time-of-day controls; lack of signal coordination, and street design features hinder the movement of goods on the system. Many of the highway and roadway infrastructure are also dated and structurally obsolete, posing additional safety issues.

Much of the region's rail system also is shared by passenger and freight rail traffic and several of the key interregional rail corridors already experience capacity constraints. The region has plans to expand intermodal rail and bulk rail terminals to meet the future demands for goods movement without increasing truck traffic on overburdened highways. Increasing traffic on rail lines will also create safety and community impact challenges that will require improvements to at-grade crossings or new rail quiet zones.

Ports and airports are also crucial pieces of the goods movement system in Alameda County and beyond. The Port of Oakland will continue to play a large part of Alameda County's goods movement future. Slow turn times at the port pose significant reliability issues. In order to serve these emerging and existing industries, Success at the Port of Oakland will require continued improvement in the frequency and reliability of rail services so that the Port can serve a larger market area and continue to grow as an attractive import port and increase the economic benefits for the Bay Area residents through increased marine terminal capacity and new transload warehouses, such as the Oakland Global Trade and Logistics Center being developed at the former Oakland Army Base.

[2] California Air Resources Board (CARB), http://www.arb.ca.gov/gmp/sfti/sfti.htm.

2.1.3 Innovation

Goal: Promote innovative technology strategies to improve the efficiency of the goods movement system.

The Bay Area is a leading national and international center of technology and innovation. Although significant goods movement, environmental, and economic challenges exist, the culture and innovative abilities of the Bay Area serve as an excellent incubator for businesses and public agencies trying to solve these problems. As funding for expanding transportation infrastructure has become more constrained, there has been increasing interest in technologies, such as ITS and connected/autonomous vehicles for improving the efficiency of freight operations, a number of which are currently being tested or applied around the nation and could be implemented here. Other technologies, such as zero and near-zero emission trucks also hold promise for addressing goods movement environmental challenges.

2.1.4 Interconnected and Multimodal

Goal: Preserve and strengthen an integrated and connected, multimodal goods movement system that supports freight mobility and access, and is coordinated with passenger transportation systems and local land use decisions.

As the regional economy grows and changes, goods movement-dependent industries will continue to place increasing demands on the region's goods movement system, but in different ways than in the past. For example, the rise of E-commerce is significantly changing the ways consumers purchase goods. This shift exacerbates "last-mile" delivery issues like inadequate delivery van parking space in concentrated urban centers, but may be met by a synergistic shift to smaller vehicles which have an easier time traveling on city streets and which may be good candidates for zero and near-zero emission technologies.

E-commerce has led to a fundamental shift in the nature of goods movement, exacerbating "last-mile" delivery issues, such as delivery van parking in urban areas.

Some jurisdictions of the Bay Area have made major commitments to denser residential and commercial development and the expansion of transit, bike, and pedestrian facilities along the major corridors serving this development. Several of the Priority Development Areas that take on additional housing and employment overlap with industrial areas. This changing land use can lead to conflicts between industrial users and residents, both in those neighborhoods historically located along goods movement corridors and those more recently designated as residential.

Another emerging area of transportation planning that represents potential opportunities for a connected, integrated goods movement system is Complete Streets. A Complete Streets approach involves, planning, designing, and operating transportation facilities and networks to serve all modes and all users. Complete Streets designs frequently seek to make streets more compact in order to reduce vehicle speeds, improving safety of all users and comfort of active transportation modes. The emphasis on more compact streets that may impede maneuverability of trucks has resulted in concern from some carriers. However, to the extent that a Complete Streets philosophy encourages planners and engineers to resolve modal conflicts at a network level (e.g., prioritizing some streets for trucks and others for biking and walking) as well as to consider how a facility design will serve all users, Complete Streets designs present an opportunity for incorporating goods movement needs into urban street networks and designs.

Complete streets concepts can be applied to industrial districts.

Source: Alameda CTC, 2012.

2.1.5 Economic Prosperity

Goal: Increase economic growth and prosperity that supports communities and businesses.

In the 1980s and 1990s, a major force behind growth in the region was the development and manufacturing of computer hardware driven by the growing demand for personal computer systems, creating substantial demand for high-cost goods movement services (air cargo and trucking). As these industries grew and changed their product mix, much of the manufacturing activities moved off-shore, while engineering, design, and other technical activities remained and expanded in the Bay Area. Another trend that impacted goods movement industries in the Bay Area was the movement of older, traditional manufacturing activities overseas and warehousing and distribution jobs to the San Joaquin Valley, primarily due to availability of cheaper land, lower labor costs, and better access to the interstate highway system.

Employment in the transportation sector overall has remained relatively stable in the last two decades, and declined less than the average among all industries during the 2008 to 2009 recession. This is partially due to tradeoffs made as decreases in some industries and shipping volumes have been replaced by increasing Pacific Rim trade through the Port of Oakland, and supporting rail and trucking activities. The growing international trade and logistics sector has been a source of middle-wage jobs that can partially offset the loss of jobs in traditional manufacturing. With apparent approval of the Trans-Pacific Partnership agreement at the Federal level, these tradeoffs can be expected to continue in similar directions, with manufacturing jobs moving off-shore even more amidst a growing logistics sector here handling increased international trade.

The Bay Area economy is likely to continue to shift away from traditional manufacturing and towards software development and information services, with increased specialty

manufacturing in the biotech and other high-technology industries that want to take advantage of the region's highly skilled workforce. These emerging industries will continue to locate in the older industrial corridors but will require new approaches to transportation that will emphasize higher value modes (like air cargo) for high-value products along with an increased emphasis on access to global supply chains through international gateways.

One emerging industry in the Bay Area that runs partially counter to these trends is the clean energy and electric vehicle sector. Tesla, a key pioneer of the electric vehicle sector with engineering headquarters in Palo Alto, has taken over factories in Fremont formerly owned and operated by traditional car companies. As the potential for mass market appeal of electric vehicles gains steam, other large tech companies in Silicon Valley are rumored to be developing similar products and buying up land in north San Jose and other nearby locations for engineering and production activities. This industry is producing middle-wage manufacturing jobs in addition to high-wage engineering jobs and will create demands on our goods movement system potentially greater than the former traditional car factories in the region, depending on the success of this sector nationally and globally. Startups such as LS9 in San Francisco are working in partnership with companies such as Proctor and Gamble and Chevron to produce renewable fuels and sustainable chemicals for consumer goods and fuels. These innovators are contributing to a shift in local manufacturing and employment, as well as influencing transportation systems and operations worldwide through development of new technology.

2.2 Goods Movement Opportunities

In order to pursue the goods movement vision and address the challenges to meeting the goods movement goals, MTC has developed a plan focused on three main opportunities. Strategies, which will be presented later in this plan, are combined into "opportunity packages" where the strategies are linked to produce even greater benefits than could be achieved by individual projects. Developing packages of strategies focused on opportunities helps the region focus on solutions rather than problems. It is important to note that with proper investments and policies, Bay Area residents and businesses can realize even greater benefits from the goods movement system than they do today. Technologies, operational strategies, and planning practices are available to ensure that these benefits can be realized while still providing residents – even those who live near major goods movement infrastructure – with a high quality of life and economic opportunity. Each of the opportunities described has sustainability components built into them, to ensure that each package will not create negative impacts on communities.

- **Sustainable Global Competitiveness.** This opportunity package builds on the unique combination of assets around the Port of Oakland, Oakland International Airport, and the redevelopment of the Oakland Army Base and recommends investments to improve this complex as a world class logistics hub. The investment approach emphasizes improvements that will support the types of logistics activity most likely to create middle-wage jobs and couples job training and workforce development to ensure that local residents can benefit from this activity. A critical element of the infrastructure investments

involves improved rail connections with the potential to remove over a thousand trucks per day from the most congested freight highway corridors. Technology and operational strategies are also included to reduce impacts of goods movement activity on the health, safety, and quality of life in neighboring communities.

- **Smart Deliveries and Operations**. Many aspects of the Bay Area's surface transportation system are largely built out, with limited opportunities to build new capacity through added lanes or new corridors. Thus, the region has an opportunity to support maximum use of ITS, connected vehicles, and other technology solutions to more efficiently use existing roadway capacity. This opportunity can be broadened to encompass new technologies and operating practices that will lead to a more sustainable freight system, as well as innovative practices that can help manage local traffic and reduce conflicts. Elements of this opportunity package will take advantage of the innovation economy and technology sectors in the Bay Area, making them an integral provider of the systems that will be needed to advance the strategies included in this package.

- **Modernizing Infrastructure.** The continued growth in traffic is putting additional pressure on goods movement infrastructure which supports a mix of traditional, as well as emerging industries. Modernizing the backbone of the freight infrastructure is thus an opportunity that should continue to be at the heart of the goods movement plan. This opportunity should focus on modernizing the road network in industrial corridors, improving safe access to industrial corridors and facilities, reducing land use conflicts along freight corridors, and improving last-mile truck routes and rail connections to existing and emerging industries.

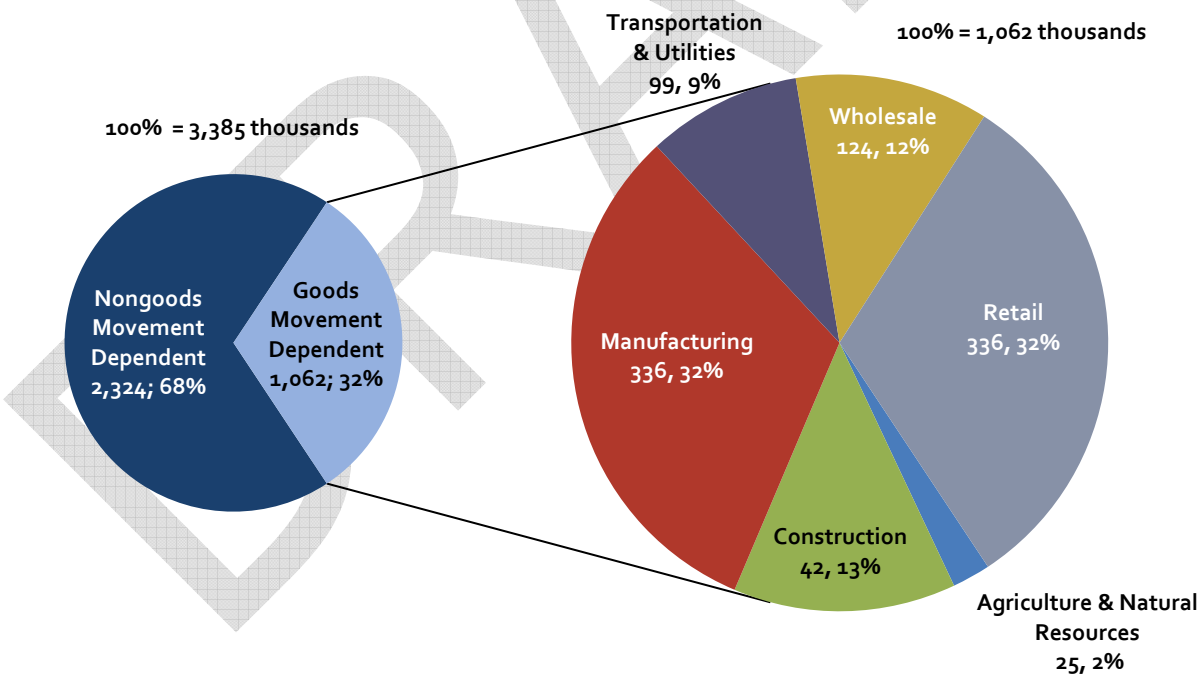
3.0 Goods Movement and the Economy

A significant share of the regional economy is associated with goods movement-dependent industries. This includes industries that either produce goods for sale or for whom transportation access to markets is a critical aspect of their business operations, such as the construction industry.

Goods movement-dependent industries are those for whom moving goods to markets is a critical aspect of their business operations. These goods movement-dependent industries include manufacturing, retail trade, wholesale trade, construction, transportation/ warehousing, and agriculture.

Figure 3.1 shows employment in goods movement-dependent industries in the Bay Area in 2011. The figure illustrates the importance of goods movement-dependent industries in the region, which represented just under one-third of all jobs in 2011. The figure also shows a highly diverse industry makeup, with vibrant retail, manufacturing, wholesale, construction and transportation/utility sectors.

Figure 3.1 Employment in Goods Movement-Dependent Industries in the Bay Area, 2011
Thousands of Employees



Source: Association of Bay Area Governments (ABAG) (*Plan Bay Area 2013*), Center for Continuing Study of the California Economy (CCSCE), and Cambridge Systematics Analysis.

The top three goods movement industries in each county by employment are mapped in Figure 3.2.

Goods movement jobs can contribute to job diversity, a significant and growing regional challenge.[3] Many jobs in the transportation, warehousing, and logistics industries do not require high levels of education and may be potential replacements for declining manufacturing employment. Across the region, goods movement occupations that have these lower educational requirements constitute 14 percent of the total jobs in occupations that do not require a college degree. The average hourly wages for some of these goods movement occupations pay near to or above the median hourly wages for all occupations[4]. The Moving to Work in the Bay Area initiative[5] has identified "industries of opportunity," industries that provide: a high percentage of living-wage jobs; have relatively low educational barriers to entry and provide job security for many positions; provide a significant number of career-ladder positions; have a significant number of job openings anticipated; are expected to drive regional economic growth; and are near high-quality transit. Transportation and Logistics has been identified as one of the important industries that can help provide this necessary job diversity.

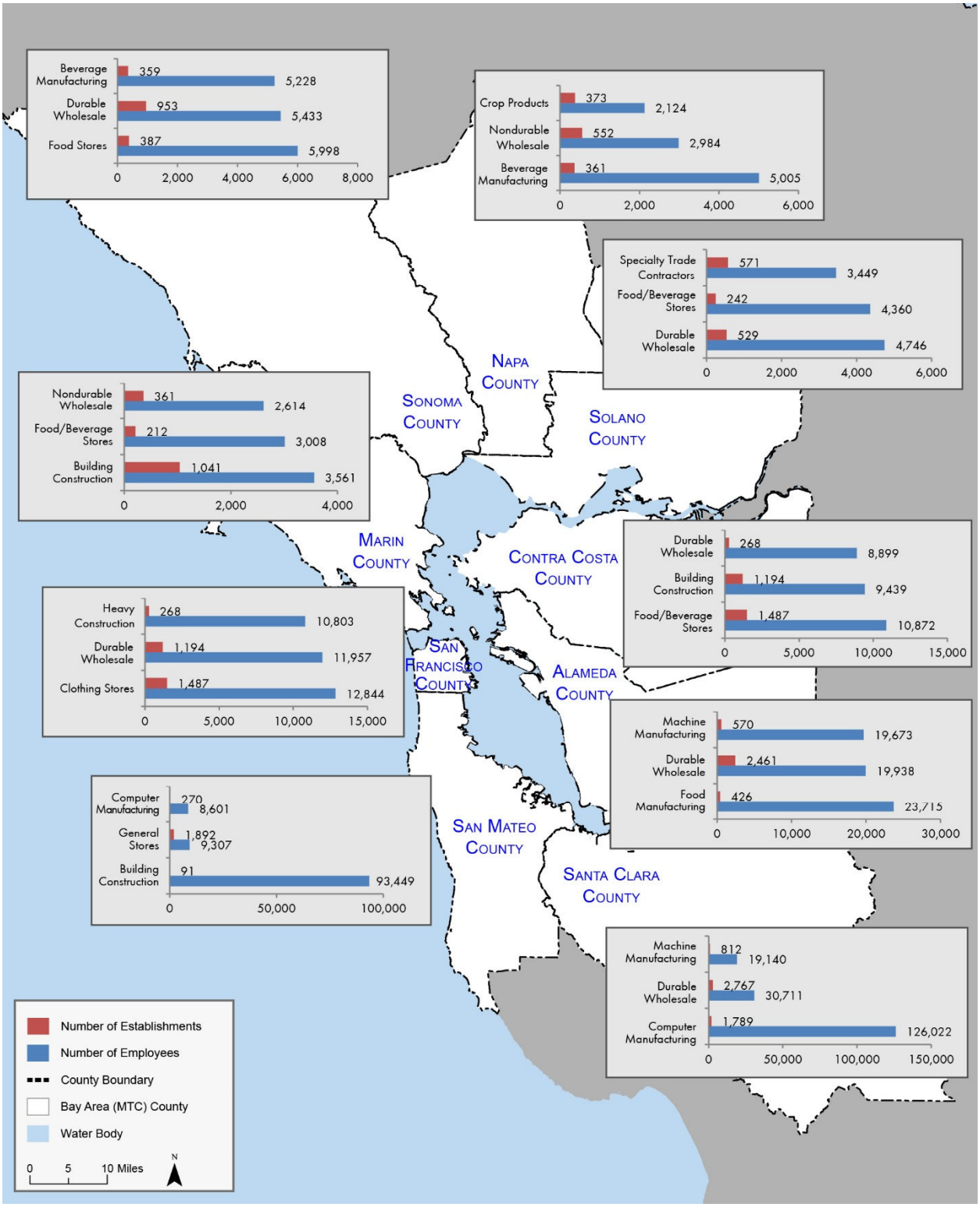
As seen in Figure 3.3, in 2012, domestic movement made up about 85 percent of all tonnage moved in the Bay Area. These freight movements show the continuing importance of interregional connections with the goods producers and distributors in the rest of the country and the continuing importance of domestic markets for Bay Area producers. While domestic freight flows will continue to dominate regional goods movement, international trade is the fastest growing element of the region's goods movement flows with exports growing at a significantly faster rate than imports. By 2040, international trade goods are expected to comprise 22 percent of the region's goods movement by tonnage and almost 31 percent by value. The role that the region's global gateways, such as ports and airports, play in facilitating this export growth is critical also to the state and national freight network. The rate of growth of trade is significantly greater in value than it is for tonnage, indicating a continuing shift of the region's trade to higher value products.

[3] Bay Area Prosperity Plan, www.onebayarea.org/regional-initiatives/Bay-Area-Prosperity-Plan.html.

[4] Analysis provided in Task 3c of this Study. Source: Wages and Employment Data from Occupational Employment (May 2012) and Wage (2013 – First Quarter) Data, California Employment Development Department (EDD).

[5] Moving to Work in the Bay Area, www.moving2work.org/brief3.html.

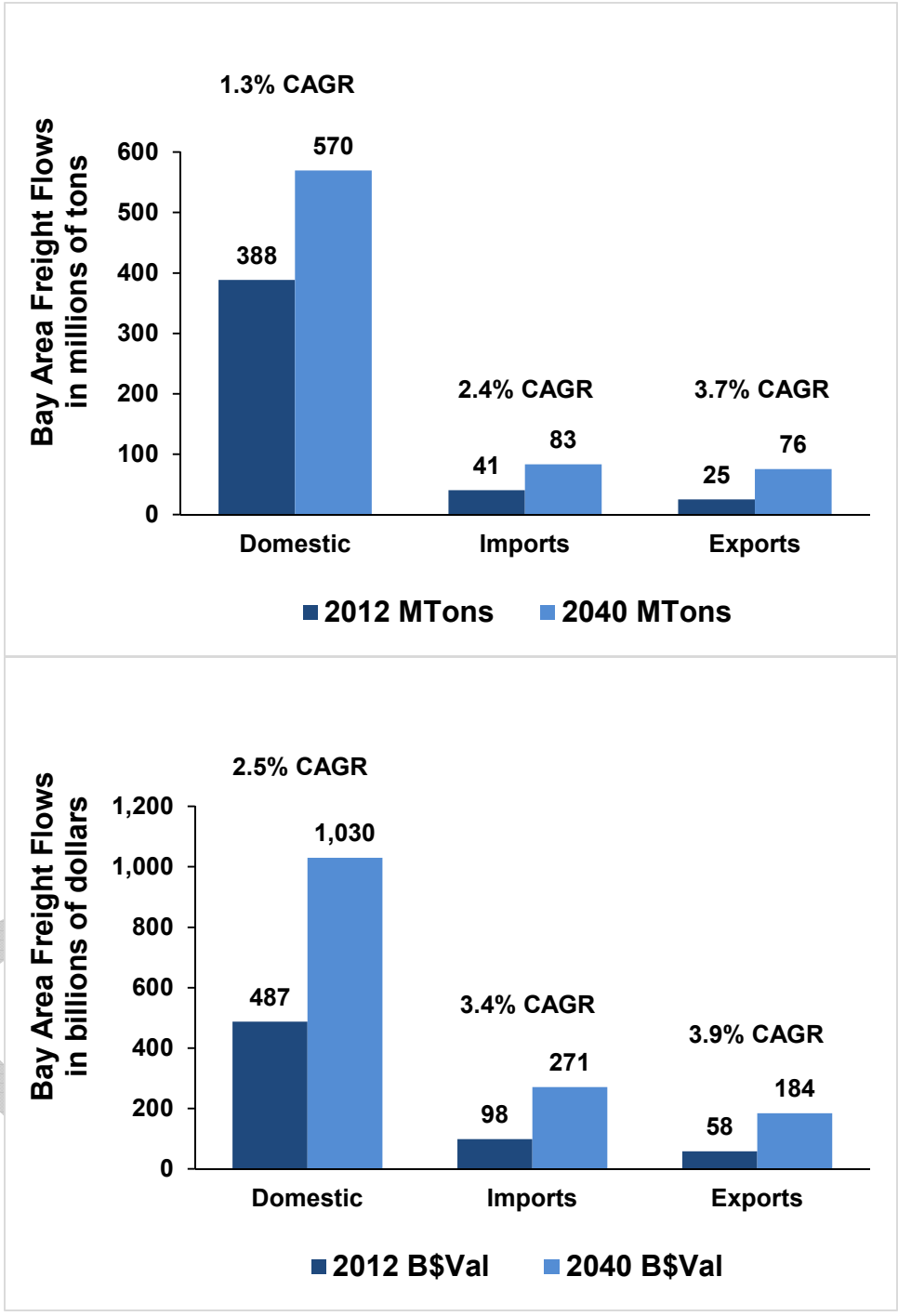
Figure 3.2 Top Three Goods Movement Industries by Employment by County



Source: Dun & Bradstreet Business Establishment Data, 2014.

Figure 3.3 Bay Area Freight-Flow Volumes and Values by Trade Type, 2012 and 2040

Millions of Tons

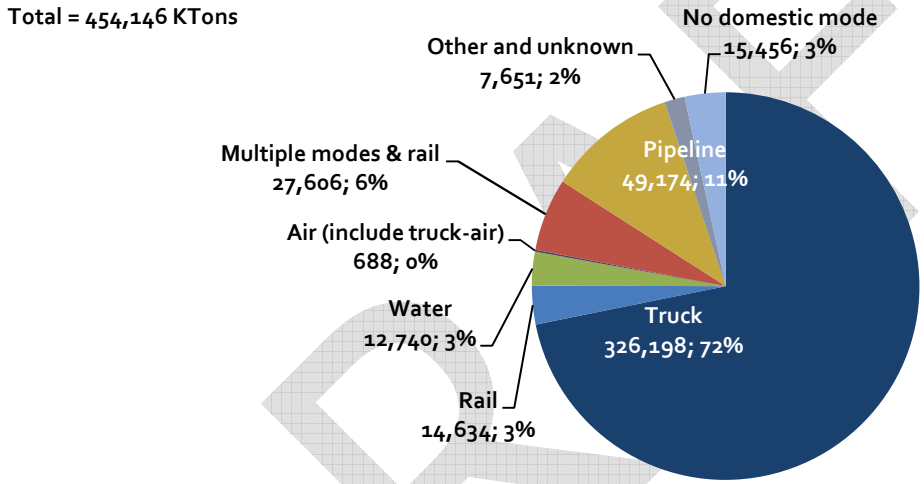


Source: FAF3.
Note: CAGR = Compound Annual Growth Rate.

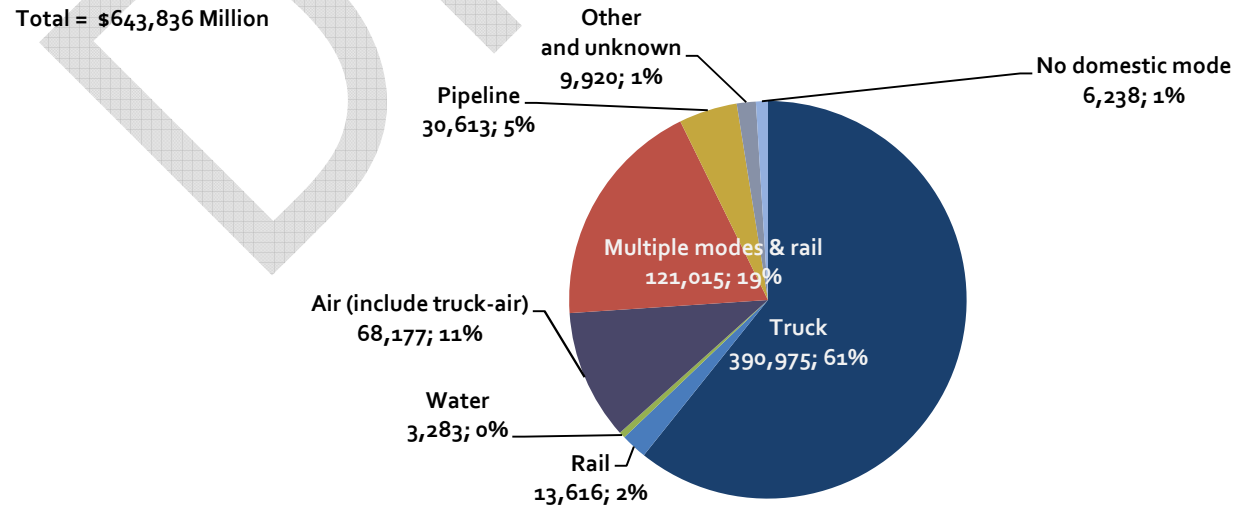
As shown in Figure 3.4, trucking is and will continue to be the predominant mode for goods movement in the Bay Area, accounting for 72 percent of tonnage moved and 61 percent of value moved in 2012. Truck activity will grow at a moderate rate but other modes will take on a more important role. There are two types of rail movements accounted for in the freight flow data – carload rail and intermodal rail. When both are considered together, rail is the second most important mode in terms of tonnage, accounting for approximately 9 percent of tonnage moved. In 2012, air cargo, with its emphasis on high-value product was the third most important mode measured by value moved, accounting for 11 percent of value moved. However, the anticipated slowing in the rate of growth in domestic air cargo and the increased reliance on intermodal rail is expected to increase the relative importance of rail. Clearly, investments will be required to support all of the modes of transportation that move goods in the region to meet future demands.

Figure 3.4 Bay Area Freight Flows by Mode, 2012

Weight in Thousands of Tons



Value in Millions of Dollars

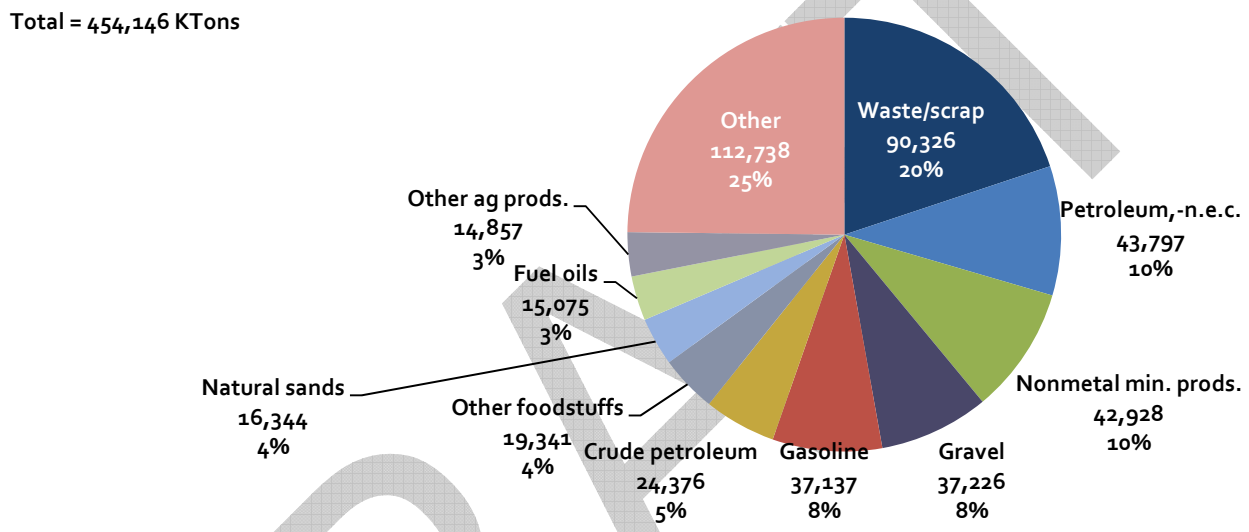


Source: Freight Analysis Framework Data; Analysis by Cambridge Systematics, Inc.

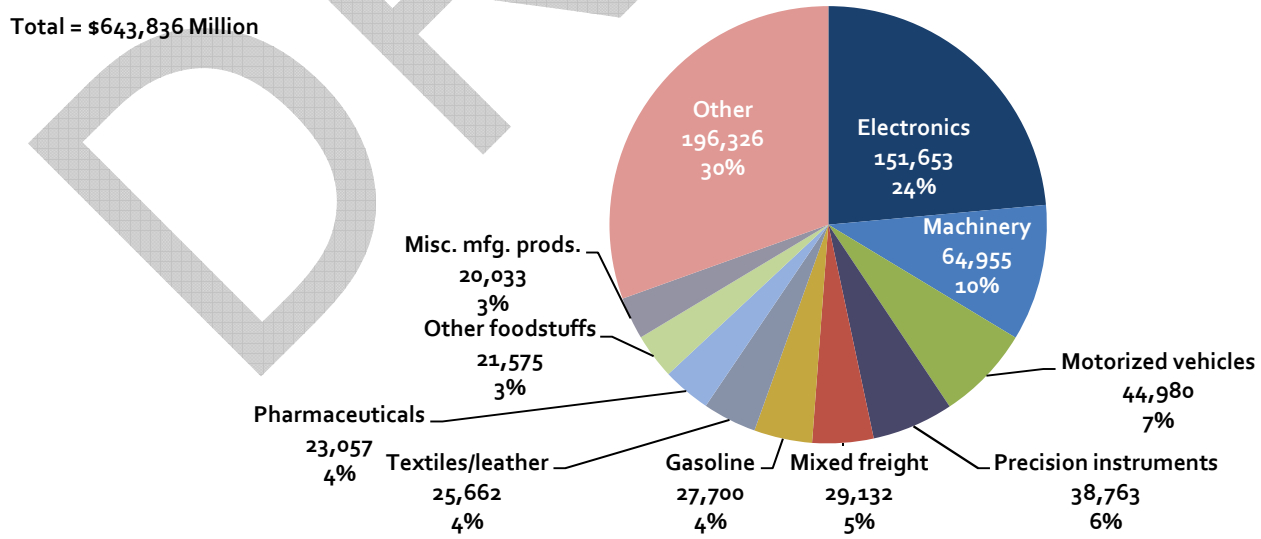
As shown in Figure 3.5, a wide range of commodities are moved in and out of the Bay Area. The products that predominate the tonnage of products moved include waste and recycled products, a major commodity exported from the ports in the region, construction inputs (non-metallic mineral products, gravel, and natural sands), fuels and refinery inputs, and agricultural products. The products that represent the highest shares of goods movement in terms of value include electronics, precision instruments and pharmaceuticals, and consumer products (including food, clothing, and automobiles). In Figure 3.6, the top three truck-borne commodities in each county by tonnage and value are shown.

Figure 3.5 Bay Area Freight Flows by Commodity, 2012

Weight in Thousands of Tons

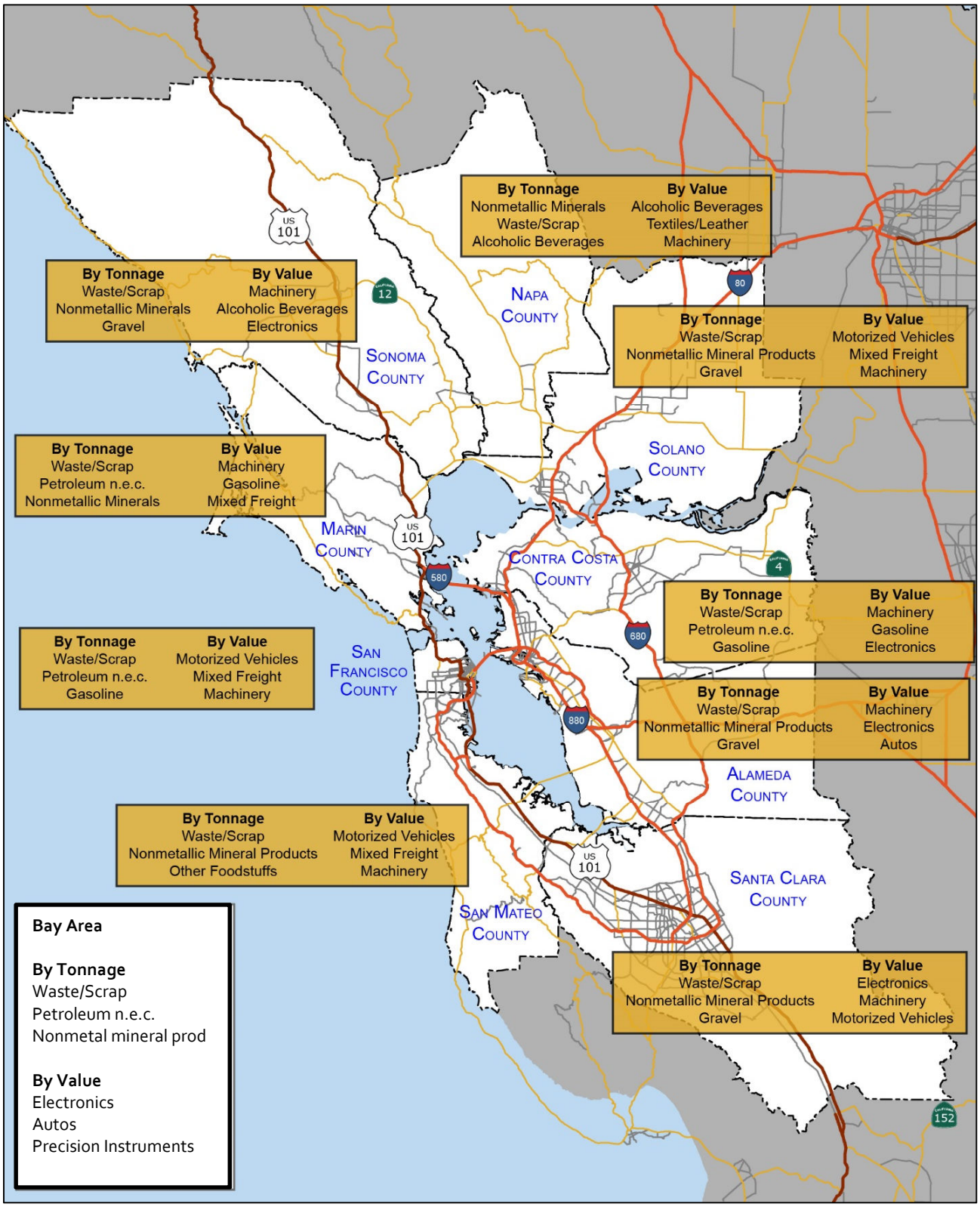


Value in Millions of Dollars



Source: Freight Analysis Framework Data; Analysis by Cambridge Systematics, Inc.

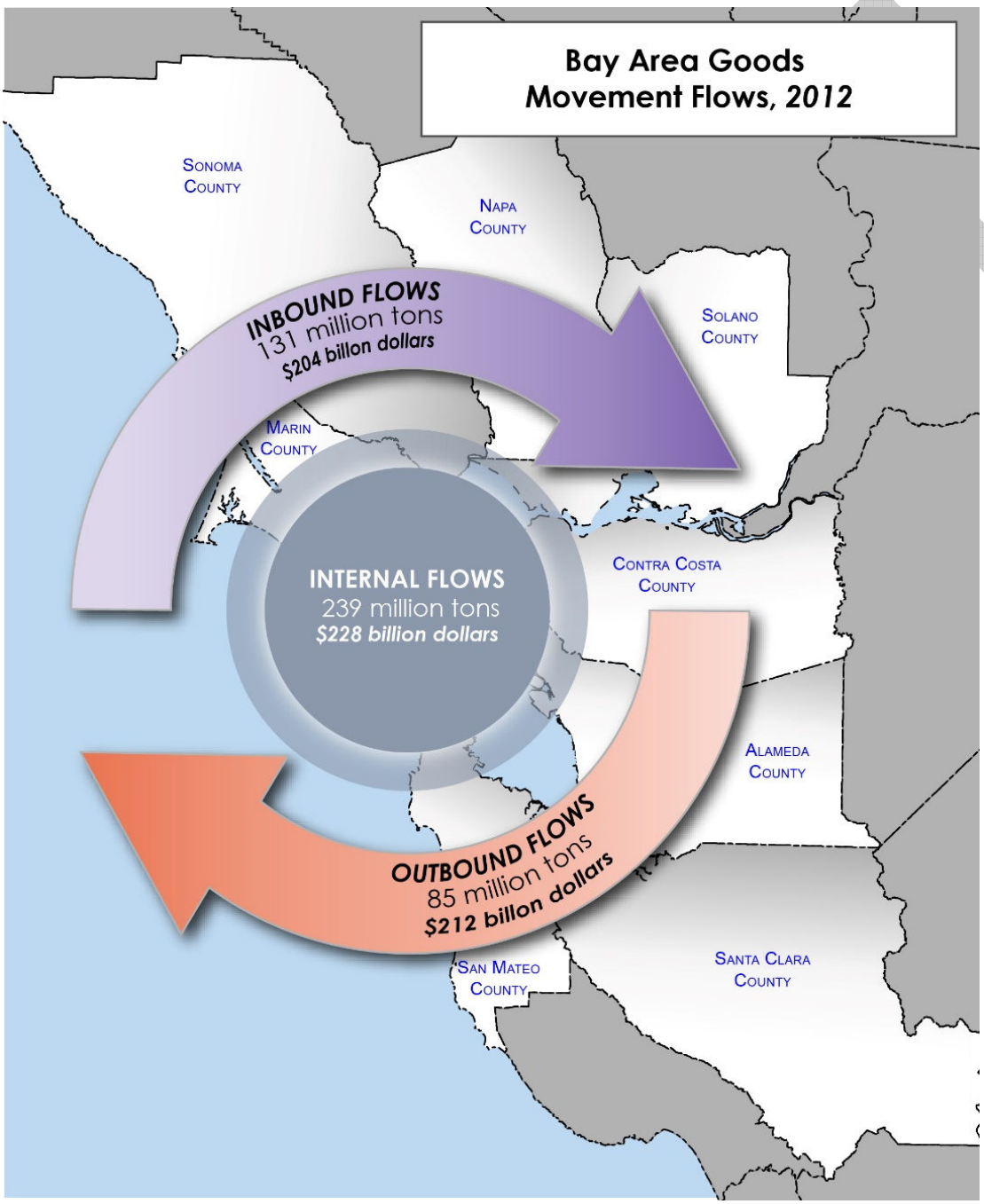
Figure 3.6 Top Truck Commodities by County in the Bay Area



Source: FAF3 Data Disaggregated by Cambridge Systematics, Inc.

Finally, as shown in Figure 3.7, regional inbound flows and outbound flows (not to be confused with international imports and exports) are roughly equal in value, although the weight of inbound flows is significantly higher than outbound flows. The internal flows of the Bay Area are slightly higher in value than either inbound or outbound flows (together they can each be seen as about a third of the value of Bay Area goods movement), but are a significantly greater tonnage, about equal to the sum of inbound and outbound tonnage.

Figure 3.7 Bay Area Goods Movement Flows, Size and Value



Source: FAF 3.5 Provisional Data and Forecasts.

4.0 Components of the Goods Movement System

The Bay Area goods movement system consists of a series of interconnected infrastructure components including highways, rail lines and rail terminals, airports, ports, and warehouse and distribution facilities. While the system is often described in terms of its modal components, it must function as an integrated whole with efficient intermodal connections. By presenting the goods movement system in terms of functions, the discussion of trends is more consistent with the way users think of the system, and also provides a focus on intermodal connections and the way the modes are linked together to meet the needs of industry supply chains.

4.1 Global Gateways

Global gateways are entry and exit points that are essential to moving high volumes of trade goods (i.e., ports, airports, and their associated inland connections). The global gateways of the Bay Area freight transportation system include the major maritime facilities at the Port of Oakland as well as the minor ports of Richmond, Benicia, San Francisco, and Redwood City, and the major international airports of San Francisco, San Jose, and Oakland which handle international as well as domestic air cargo. Figure 4.1 shows the global gateway facilities in relation to connecting rail and highway corridors of the multimodal freight system.

With international trade growing at a faster rate than domestic trade, the Port of Oakland is slated to see growth that exceeds background economic growth. The Port of Oakland expects continued growth in exports with cargoes such as agricultural products, instrumentation and medical supplies, and wine as major high-value products. On the import side, the Port of Oakland can continue to be a gateway for products ultimately destined for Northern California and parts of Nevada and Utah. With this trend also comes growing demand for transloading nearby to the Port and creates additional economic opportunities for the nearby areas.

Transloading of international cargo involves the direct transfer of the contents of a marine container into a domestic 53-foot rail or truck container (or trailer) by a logistics service provider (LSP). This occurs at a transload facility near a Port, such as the Port of Oakland, for onward movement to a U.S. interior point, such as a city in the Midwest. The primary benefit that transloading offers to a shipper is the reduced cost of inland transport, since the contents of three 40-foot marine containers can be transloaded into two 53-foot domestic containers. During the transloading process, value-added services are often provided (such as affixing labels or packages for shelf sales at stores), creating local jobs in transloading warehouses. Finally, transloading reduces the transport of empty 40-foot containers and allows shippers to delay decisions on final destinations of products, facilitating Just-in-Time practices.

Figure 4.1 Bay Area Global Gateways and Connecting Corridors

Source: Caltrans District 4 Geographic Information System (GIS), July 2013.

Airports primarily handle higher value cargo such as electronics and related components that amount to significantly less tonnage than handled by marine ports. Due to the high-dollar value of these airborne cargo flows, the airports are also critically important global gateways for the region. Multimodal connections to the airports are also a part of the goods movement system for these high-value commodities.

4.2 Interregional Corridors

The inter- and intraregional corridors consist of primary highways and rail lines that serve to connect the global gateways of the central Bay Area to the rest of the state and other domestic markets. This network provides primary access to major facilities such as the Port of Oakland and the international airports of San Francisco, San Jose, and Oakland, rail yards, and warehouse/industrial districts. The characteristics of each of these major corridors are listed in Table 4.1 at the end of this section.

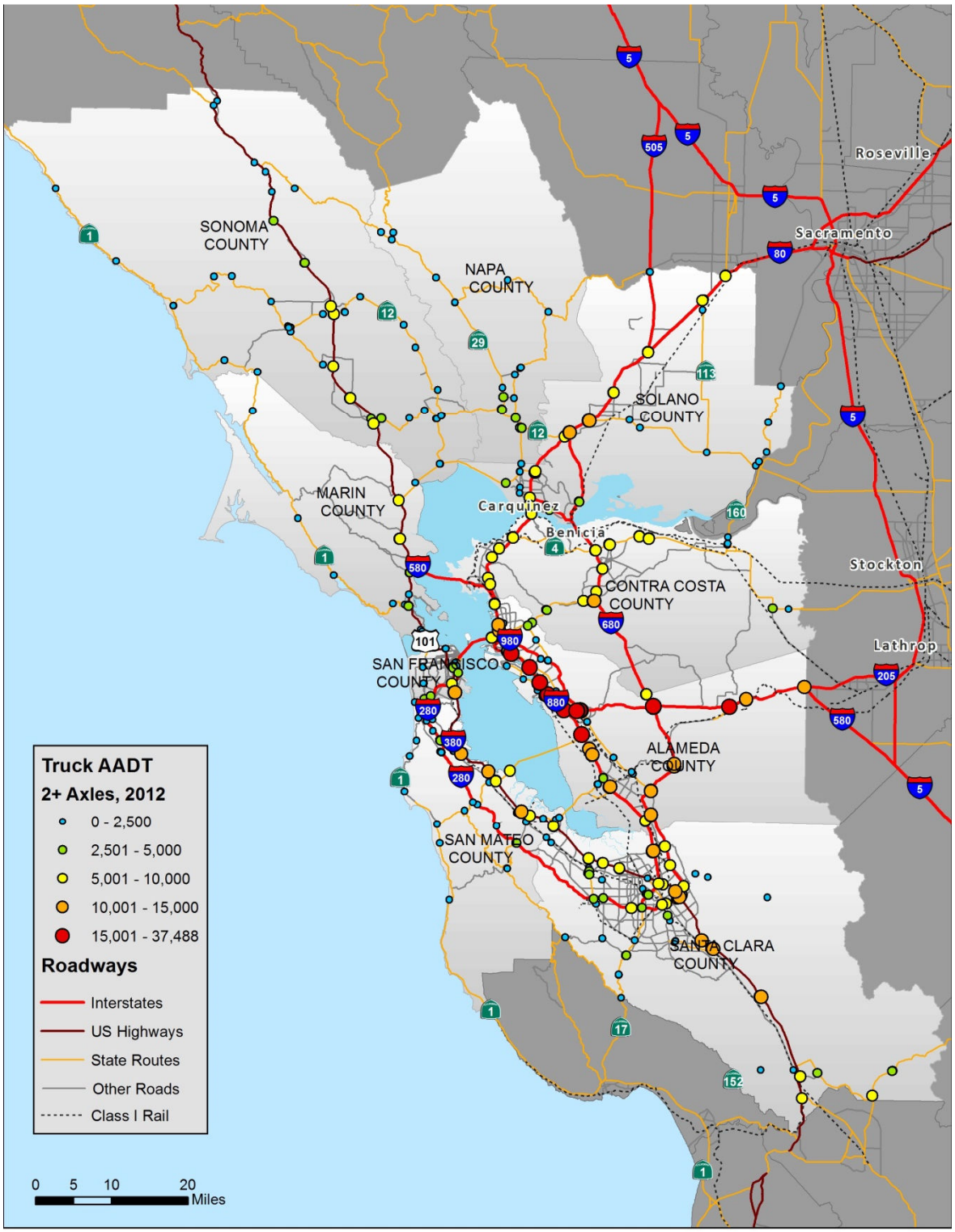
4.2.1 Highways Corridors

Key interregional and intraregional truck corridors in the Bay Area include I-80, I-580, I-880, and I-680, U.S. 101, and limited segments of SR 92 (San Mateo Bridge), SR 152, SR 4, SR 12 and SR 37. Most of these corridors, shown in Figure 4.2, carry between 5,000 and 15,000 trucks per day on average, performing both long-haul and short-haul truck moves. Key segments of I-880 and I-580 connecting the Port of Oakland to the San Joaquin Valley, however, carry between 15,000 and 37,000 trucks per day on average. The continued relocation of distribution facilities out of the Bay Area to places further east in the San Joaquin Valley and the flows of products to the region from these distribution facilities by truck are going to continue to put greater pressure on this already congested corridor, increasing conflicts between trucks and automobiles.

4.2.2 Rail Corridors

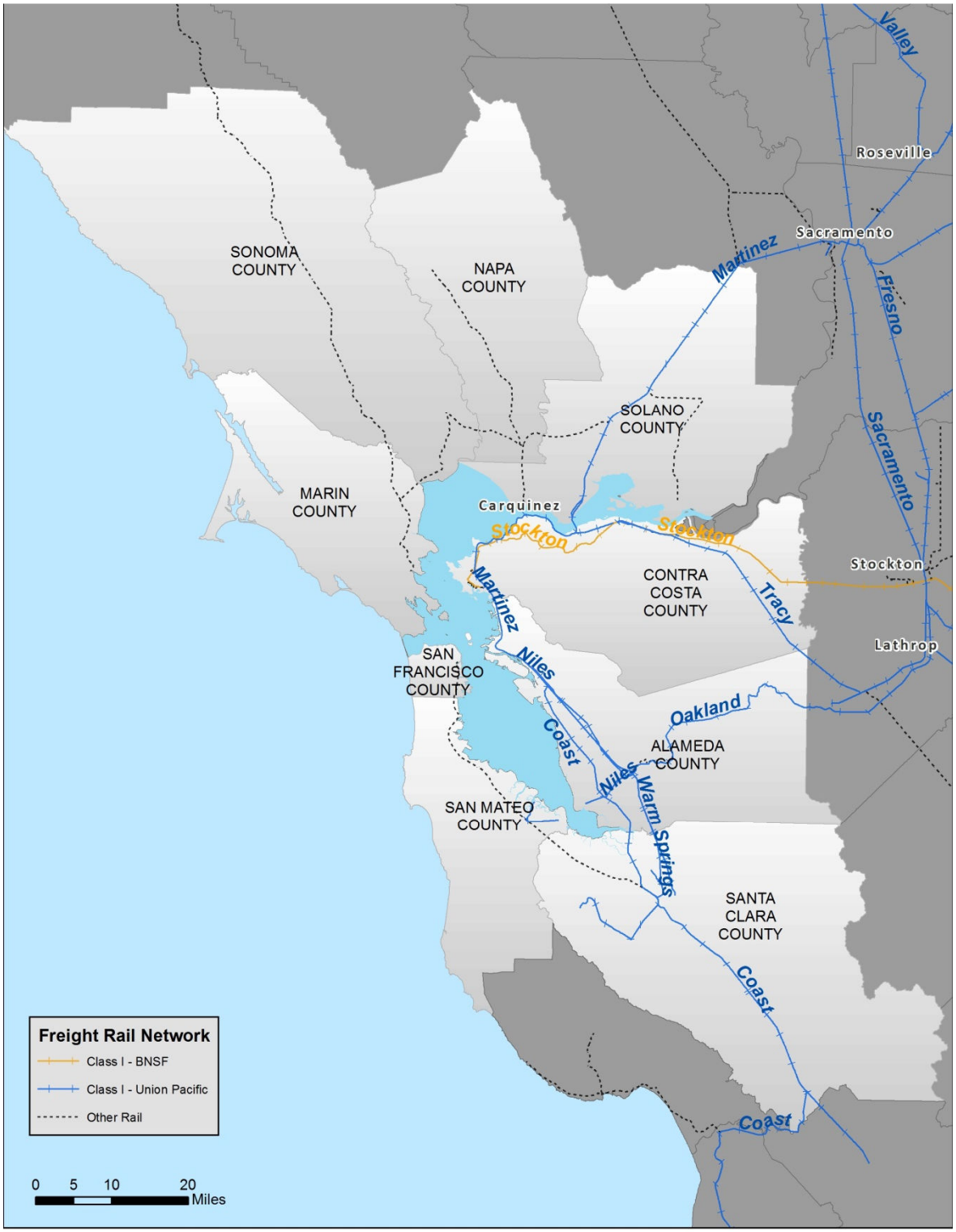
Efficient utilization of existing infrastructure is also an essential component of railway service planning and marketing. As private entities, railroads sell capacity to deliver current and future freight volumes. As shown in Figure 4.3, two Class I rail carriers, UP and BNSF, operate in the Bay Area. The UP maintains and manages the Martinez Subdivision, Niles Subdivision, Coast Subdivision, Oakland Subdivision, Warm Springs Subdivision, and the Tracy Subdivision. BNSF operates the Stockton Subdivision. Many passenger rail services, including the Capitol Corridor and the ACE Train also run on these lines. Future growth on these lines will likely be dictated by the changing commodity patterns described previously and strategies to increase rail movements to/from the Port of Oakland to take advantage of rail's efficiencies for long-haul movements and to reduce truck traffic growth rates on interregional highways.

Figure 4.2 Bay Area Truck Volumes (Two plus Axle), 2012



Source: Caltrans 2012 GIS truck count data, Cambridge Systematics, Inc.

Figure 4.3 Freight Rail Network in the Bay Area



Source: Rail lines data obtained from Caltrans Office of Systems and Planning; Caltrans District 4 GIS Dataset, as of July 2013.

Note: Subdivisions names are shown in the map (Blue = UP, Yellow = BNSF).

4.3 Local Goods Movement System

The local goods movement system refers to networks of city streets that move freight to and from its origins and destinations. Last-mile connectors, local streets that provide the critical connections between major freight facilities and the interregional and intraregional corridors, are also an important part of the local goods movement system. The growing use of e-commerce and the shift towards a knowledge-based economy means parcel service and deliveries to commercial and residential areas are becoming increasingly important. Major arterial truck routes are often used as alternatives to congested freeways for city-to-city truck movements. Farm-to-market roads in the rural parts of the region are also a vital part of the local goods movement system and serve important economic functions.

Table 4.1 Goods Movement Corridors in the Bay Area

Counties in Bay Area	Corridor	Other Key Corridor Elements	Functions of the Corridor	Corridor Description
Alameda, Santa Clara	I-880	• UP Rail Lines (Niles, Oakland, Coast Subdivisions) • Port of Oakland • UP Railport, BNSF Oakland Intermodal Gateway • Oakland International Airport • San Jose Mineta International Airport	Global Gateway, Interregional, Intraregional	Major North-South truck corridor supporting East Bay. One of the region's primary international gateway corridors and intermodal rail terminals. Major industrial corridor with much of the region's historic industrial core.
San Francisco, Alameda, Contra Costa, Solano, Napa	I-80 (Central Corridor)	• UP Martinez Subdivision • Port of Benicia • Travis Air Force Base • Cordelia Truck Scales • Major Interchange at I-80/I-680/SR 12	Interregional, Intraregional	Primary corridor connecting Bay Area to Sacramento and northern tier states across the U.S. Also connects Bay Area counties.
Contra Costa, Alameda, Marin	I-580/SR 238 (Altamont Corridor)	• UP Oakland Subdivision • M580 Marine Highway • Port of Richmond (including Richmond Pacific Rail) • BNSF Rail Yard	Interregional	Primary truck corridor connecting the Bay Area to the rest of the U.S. to the continental U.S. Secondary freight rail line that is expected to grow increasingly important with expansion of rail terminal at the Oakland Army Base.
Santa Clara, San Mateo, San Francisco, Marin, Sonoma	U.S. 101	• SFO • Port of San Francisco (including San Francisco Bay Railroad) • Port of Redwood City • Transbay bridges • SMART rail on NWP Line	Global Gateway, Interregional, Intraregional	Major goods movement corridor serving the Peninsula in the Bay Area. Also connects agriculture shippers on North Bay (Sonoma), Central Coast, and North Coast with markets in Bay Area. Also primary access to SFO.

Counties in Bay Area	Corridor	Other Key Corridor Elements	Functions of the Corridor	Corridor Description
Santa Clara, Alameda, Contra Costa	I-680	• Port of Benicia • Valero Oil Refinery	Global Gateway, Intraregional	Serves trucks moving from South Bay and Fremont and connecting to and from the warehouses in the San Joaquin Valley via connections with I-580.
Sonoma, Napa, Solano, Marin	SR 12/SR 37	• SMART Rail on NWP	Interregional, Intraregional	Helps connect North Bay to the Port of Oakland, San Joaquin Valley, and rest of the region.
Santa Clara	SR 152		Interregional, Intraregional	Important connection providing link that connects the San Joaquin Valley to the coast. Recently selected as a Caltrans Focus Route.[a]
Contra Costa	SR 4	• BNSF and UP Lines from Stege/Port Chicago to Stockton • UP Tracy Line (Martinez to Lathrop)	Intraregional, interregional	Serves refineries and chemical manufacturers in CCC, provides connections to Central Valley

[a] Focus routes are a set of 10 corridors designated by Caltrans that are of the highest priority for completion to at least minimum facility concept standards over the next 20 years. Completion of these routes will help ensure that a statewide system is in place that can accommodate higher-volume interregional trip movements. http://www.dot.ca.gov/hq/tpp/offices/oasp/ITSP_document_11_25_2013_rev1.pdf#zoom=75.

5.0 Gaps, Needs, Issues and Deficiencies in the Goods Movement System

The Bay Area goods movement system supports a vibrant economy and enables commerce. However, there are system performance gaps and deficiencies that must be addressed in light of the various growth trends discussed in earlier sections. This section identifies the most important gaps, needs, issues, and deficiencies of each function of the goods movement system as they relate to the vision and goals described earlier. The use of performance measures to document gaps and deficiencies provides insight into which parts of the goods movement system are working well today and expected to in the future and indicates weaker system components where improvements should be considered. The performance measures are also used to evaluate candidate strategies and help with the development of the final opportunity packages that are included in the Plan.

Performance measures are data-driven tools that provide agencies a way to assess the condition of the transportation system, identify gaps and opportunities for system improvements, identify and evaluate strategies to meet goods movement goals, and monitor ongoing performance. They also can be used to help decision-makers allocate limited resources more effectively than would otherwise be possible.

5.1 Global Gateways Gaps, Deficiencies, and Needs

After a number of years of declining share of West Coast trade, the Port of Oakland has seen its share begin to grow again and return to pre-recession levels. The Oakland Army Base redevelopment and associated rail and warehousing investments will make the Port more attractive to shippers. However, there are some significant obstacles to growth as well as some landside challenges that need to be addressed, including impacts on neighborhoods nearby. The Oakland International Airport and San Francisco International Airport currently do not face significant capacity constraints or issues, though local access routes can be improved. One of the critical needs at the Oakland airport is the building of a dike in the area of the airport used most for air cargo movements, to prevent runway flooding that could grow more critical in the future as a result of climate change impacts. Likewise, the San Francisco International Airport faces vulnerabilities from sea level rise. San Jose International Airport does not face present capacity constraints, but is locked in to a limited land footprint without expansion opportunities should need arise. The smaller ports are not currently called on to service high demand. The Port of Richmond in particular is well situated to expand operations if need arose in the long term, but would need significant advance planning in order to do so.

5.1.1 Port of Oakland Operations Challenges

While the Port of Oakland is "Big Ship Ready," the sudden surge in larger post-Panamax ships is creating unintended consequences not only for the portside operations but also land side operations. A large vessel offloads in one day the same amount that a terminal typically once handled over the course of two to three days, which creates bottlenecks and operational issues that contribute to queues outside the terminal gates, increases in the amount of time it takes

trucks to pick up or drop off a load, and decreases efficiency in terminal operations (see Figure 5.1 as an example). The larger vessels are also creating winners and losers as marine terminals with berths capable of accommodating the larger ships continue to attract more cargo, while those that cannot, continue to see throughput decline.

Figure 5.1 Trucks Standing on Median of Middle Harbor Road in After Hours of Port Service
Port of Oakland Site Visit on October 1, 2014

To date, terminal operators at the Port have accommodated the larger vessels by eliminating truck chassis storage on the terminals. Now truckers come in with an empty chassis ready for loading. This increases the amount of land available to store containers and storage is further increased by stacking containers, something that cannot be done if the containers are loaded directly onto a truck chassis. While the terminals have sufficient backland capacity for container storage, the terminal operators have not implemented adequate operational changes to address the cargo surges, such as more shifts or implementation of new technology to help manage the storage and retrieval of containers. In addition, truckers do not have set schedules for picking up or delivering containers from the terminals, so trucks show up at times that work for their own schedule. As a result, truck queuing regularly extends as far north as Maritime Street/Wake Avenue/Engineer Road and northwest on Burma Road, as far west as I-880 on 7th Street, and from the south to Adeline Street and I-880. Truck turn times from the entrance gate to exit gate are more than 60 minutes for up to 50 percent of the trucks. Outside of the gates, trucks have been reportedly waiting two to four hours. Whereas, truckers were previously making three to four turns at the Port per day, they are now making two turns. [6]

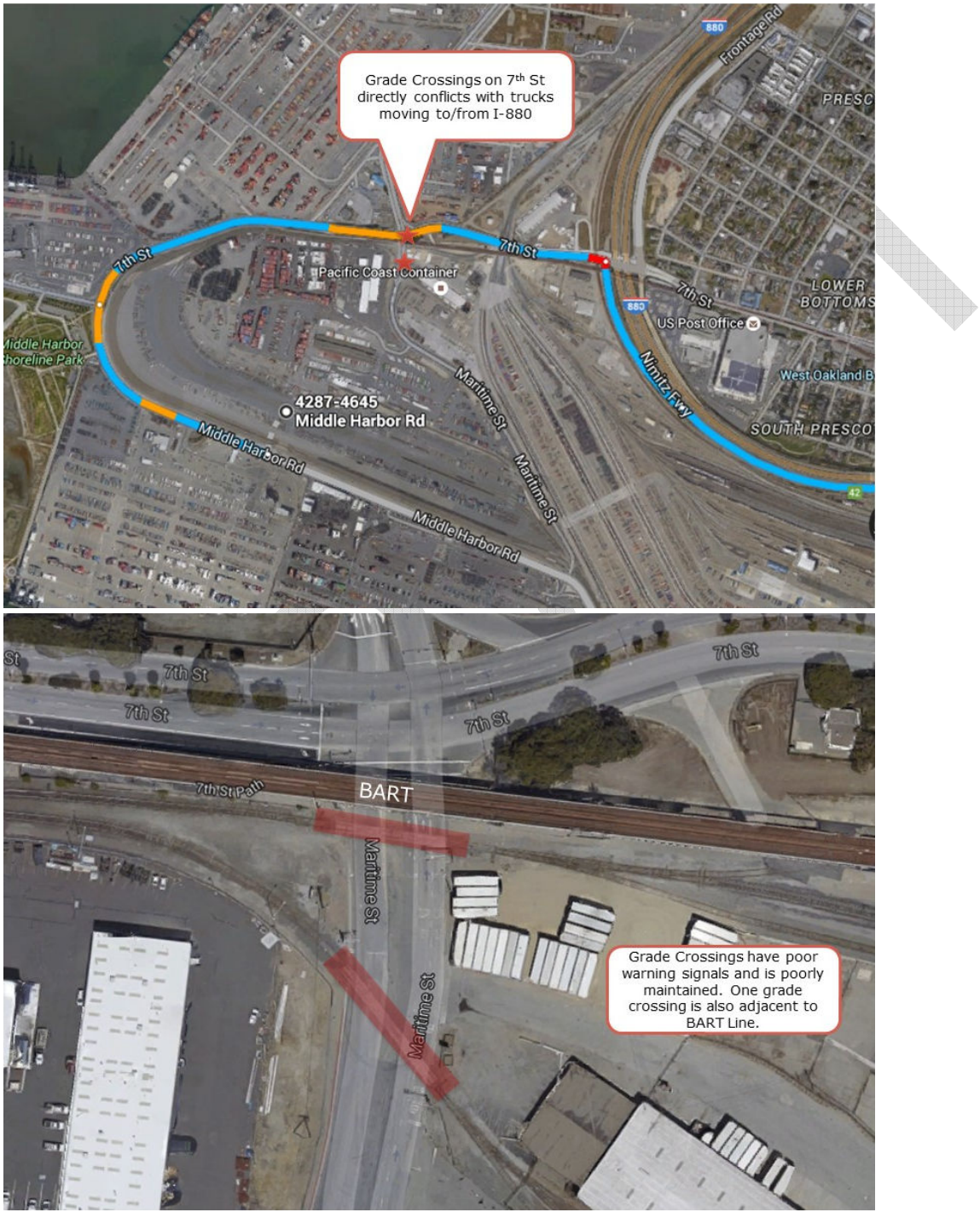
5.1.2 Local Access Issues

In addition to challenges within the Port, access to and from the Port also presents significant challenges. The most significant constraint, aside from long wait times at the gates, is the impact of at-grade rail-road crossings in the Port, specifically on Maritime Street, where both at-grade crossings (one near 7th Street and the other near Middle Harbor Road) can simultaneously be blocked by one train. A blockage of the at-grade crossing of Maritime Street near 7th Street also results in significant truck queues that can extend as far back as I-880. The proposed grade separation and roadway reconfiguration of 7th Street from Maritime Street to Navy Roadway would eliminate the at-grade crossing of Maritime Street near 7th Street and

[6] Port of Oakland Staff Interview.

improve operations. A third gateway to the Port, Adeline Street, features a bridge that is structurally obsolete and has grades that are not safe for trucks to traverse. Figure 5.2 depicts the issue. The top image shows the location of the two grade crossings relative to I-880, the bottom image shows a zoom-in of the two grade crossings that depicts their conditions.

Figure 5.2 Grade Crossings at 7th Street and Connectivity to I-880



Source: Google Earth Images with Cambridge Systematics Annotations.

5.1.3 Warehouse, Ancillary Service, and Rail Terminal Capacity Issues

The Port of Oakland has sufficient marine terminal capacity to realize significant growth, and the economic benefits to the County of being able to service this growth are significant. Continuing growth in Pacific Rim trade and capacity and congestion issues at other West Coast ports could make Oakland an important player in the West Coast trade system. In addition, to the operational issues already mentioned, the Port lacks several other features that are important for future growth. Improved rail service needs, which would require expanded intermodal rail terminal capacity and improvements on the rail mainlines accessing the Port, are discussed later in the section describing overall rail needs in the County. The Port would also benefit from increased nearby transload warehousing capacity, expanded cold storage and agricultural product terminals, and a variety of truck services nearby the Port to provide for the needs of trucks serving the Port, which are all proposed as part of the Oakland Army Base Redevelopment Project that still need additional funding.

5.1.4 Port of Oakland Air Quality and Public Health Impacts

Queuing and congestion lead to many air quality and health impacts for neighborhoods nearby the Port. Emissions from Port operations can create significant health risks. In addition, exposure to noise and light also can adversely affect the health and well-being of residents. Particulate matter and nitrogen oxides are the two pollutants most associated with truck, rail, and ship pollution; and in recent years, the risks attributable to these two pollutants have dropped significantly in the Bay Area, in large part due to emission regulations, focused efforts to control emissions by the Port of Oakland, and technological advancements. Considering current regulations, and assuming no additional regulations or policies will be adopted, fine particular matter emissions from on- and off-road motor vehicles are expected to decline significantly until 2020 due to aggressive regulations on diesel engines.

However, despite tremendous strides in pollution reduction, the West Oakland community, along with several others along the industrial corridors of Alameda County, suffer from disproportionate health impacts due to port operations and proximity to other goods movement activities and non-goods movement activities (e.g., auto traffic on freeways next to these communities). The Port of Oakland contributed about 29 percent of the pollution to the West Oakland community, with the rest being contributed by other local sources in and around West Oakland[7]. This suggests that solutions that address local sources of pollution as well port-related emission reductions strategies will be important to implement.

The operational issues and grade-crossing issues discussed previously also generate a variety of secondary issues for the Port and the nearby West Oakland community. To fully document these issues, a case study was conducted and the results are summarized in the callout box below – *Case Study 1: West Oakland and Port Development*.

[7] Improving Air Quality and Health in Bay Area Communities: Community Air Risk Evaluation Program Retrospective and Path Forward (2004 – 2013); BAAQMD, April 2014.

5.1.5 Needs of Smaller Ports in the Bay Area

The Ports of Richmond, Benicia, San Francisco, and Redwood City play important niche functions in the regional seaport system. All would like to expand to meet demand for the projected growth in bulk exports and handle large construction equipment and heavy materials needed to support the booming construction sector throughout the region. The Port of Richmond public port recently expanded and re-configured its facilities to create an expanded space for auto shipments and finishing work on imported vehicles. At the present time, this facility is operating at or near capacity. Business expansion and/or the ability to handle bulk exports at this facility would likely require land acquisition with the potential to create land use conflicts in the adjacent community.

Both the Port of San Francisco and the Port of Redwood City have potential opportunities to expand bulk export business. In the future this may require expansion of bulk terminals.

5.1.6 Air Cargo Needs

At the present time, the region's air cargo system seems to have sufficient capacity to expand cargo operations to meet anticipated demand. Over the past decades, air cargo has seen significant swings in both volumes and types of service and since 2000, air cargo demand has declined in the Bay area as a whole. Although the trends leading to the decline in air tonnage will likely continue over the foreseeable future, the shift to high-value goods is leading to some new sources of demand that could stabilize future demand. In addition, the trend towards serving growing e-commerce demands from West Coast facilities is leading to growing demand for air cargo services in the Bay Area and strong demand for warehouse space near the region's airports from third party logistics (3PL) providers serving e-commerce needs of major retailers. While this Plan does not include specific strategies to address air cargo capacity needs, it will be important for regional planners to monitor these volatile trends to ensure that the region has the air cargo capacity it needs.

The biggest immediate need facing the region's airports is improved roadway access. Air shipping provides the fastest and generally most reliable mode of transport for long-distance moves, but it also is the most expensive mode of goods movement. Air cargo is often used for high-value, time sensitive, lighter weight products. E-commerce also relies heavily on air transport for next day deliveries. However, for the air cargo system to work effectively, shippers must be able to make reliable connections so as not to miss cutoffs for air service. Both of the region's principal air cargo airports, SFO and OAK, experience significant peak-hour congestion and reliability issues on the major truck routes leading to the airports (U.S. 101 and I-880), as well as on local access routes.

One issue facing the Oakland Airport is related to potential flooding, given that the airport will be one of the earliest assets to be impacted by sea- level rise. In addition, some parts of the existing airport perimeter dike currently do not meet flood control standards. Since the main cargo and passenger runway have parts below sea-level, this poses immediate risk. According to current projections, climate change will cause the Bay to rise 16 inches by midcentury and

55 inches by the end of the century.[8] With a 16 inch sea rise event, both the commercial runway at South Field Airfield and the general aviation runway at North Field Airfield will experience high tide and storm surge. The temporary or permanent disruption of OAK due to flooding could result in serious consequences for the region's economic health, as well as public health and safety. Additional airport connecting routes including Hegenberger Road and Airport Drive will also be affected.

[8] Sea-Level Rise Task Force of the Coastal and Ocean Resources Working Group for the Climate Action Team (CO-CAT). 2010 (October). State of California Sea-Level Rise Interim Guidance Document. Developed with science support provided by the Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust. Available: http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20100911/14.%20SLR/1011_COPC_SLR_Interim_Guidance.pdf.

Case Study 1. West Oakland and Port Development

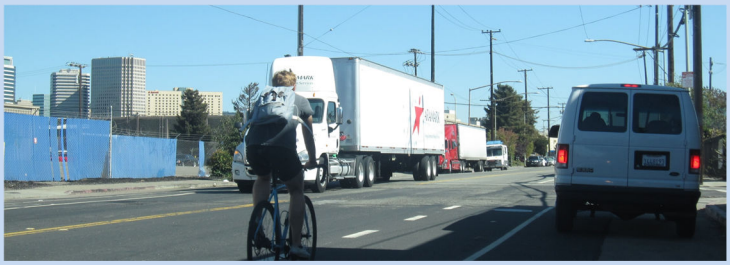
The proximity of the West Oakland neighborhood to the Port of Oakland and the former Oakland Army Base has created challenges for the neighborhood. Because the Port is such an important goods movement facility for the region, a case study was conducted to identify more clearly the major issues related to port operations that impact West Oakland. The specific challenges and how we are addressing them in the plan are discussed below.

- **Air pollution.** Diesel particulate matter (DPM) levels in West Oakland were three times higher than the average for the Bay Area in 2005, contributing to high cancer risk. Fortunately, air quality has been significantly improved with 70 percent reductions in diesel particulate matter between 2005 and 2012 through shore power infrastructure, "no idling" policies on port roadways, cleaner truck and locomotive technology, and cleaner fuels. Improving the locomotive fleet is key to continuing improvements as rail is expected to account for the largest growth in future freight volumes. The Goods Movement Plan contains strategies that will continue to address this issue by introducing zero and near-zero truck technology, and providing for a rail and terminal emission reduction program.
- **Roadway surface degradation.** Pavement condition is critical to quality truck access, but many of the access roads are in poor condition, including Maritime St north of 7th St, West Grand Ave east of Mandela Parkway, and many of the streets around the Grand/Mandela intersection where the highest concentration of truck-intensive businesses exist. A program of local street projects to improve truck route access is recommended as part of this plan to address issues on local roads.
- **Truck-related traffic accidents due to modal conflicts.** Hot spots of crashes include the I-880 interchange with I-980, I-80 on approach to the Bay Bridge, the 7th St/Maritime St intersection, the W Grand Ave/Maritime St intersection, and ramps to I-880. Limited sight lines, blocked lanes, and signal timing cause potential conflicts between trucks/autos and trains at the rail crossing near 7th St/Maritime St. Projects included in the Plan such as the 7th St grade separation, the Adeline bridge improvements, and various interchange improvements on I-880 are all designed to address these issues and improve traffic operations on the approach to marine terminals.
- **Traffic violation and enforcement issues.** Local signage is often faded and unreadable, contributing to trucks violating local traffic rules regarding turning, stopping, and parking. The Plan includes a program to improve freight signage on key truck routes.

Other key issues to be addressed at the Port are:

- **Operational inefficiencies.** Turn-about times of trucks entering the Port average between one to two hours and can range up to six hours. Trucks can expect only two turns through each day, as opposed to three turns a decade ago. Strategies such as extended gate hours at the Port and the Freight ITS (Freight Advanced Traveler Information Systems (FRATIS)) project will all contribute to improved terminal efficiency.
- **Lack of overnight truck parking facilities.** Trucks arriving after the 4:30 p.m. cutoff park in the median of roadways outside the port overnight, adding risk and liability to truckers and cargo owners. The Port is working to provide more overnight parking and the rail strategy included in the Plan could help reduce the number of truck drivers looking for overnight parking.

Figure 5.3 3rd Street between Adeline Street and Market Street – Potential Safety Conflicts



5.2 Interregional and Intraregional Corridor Needs

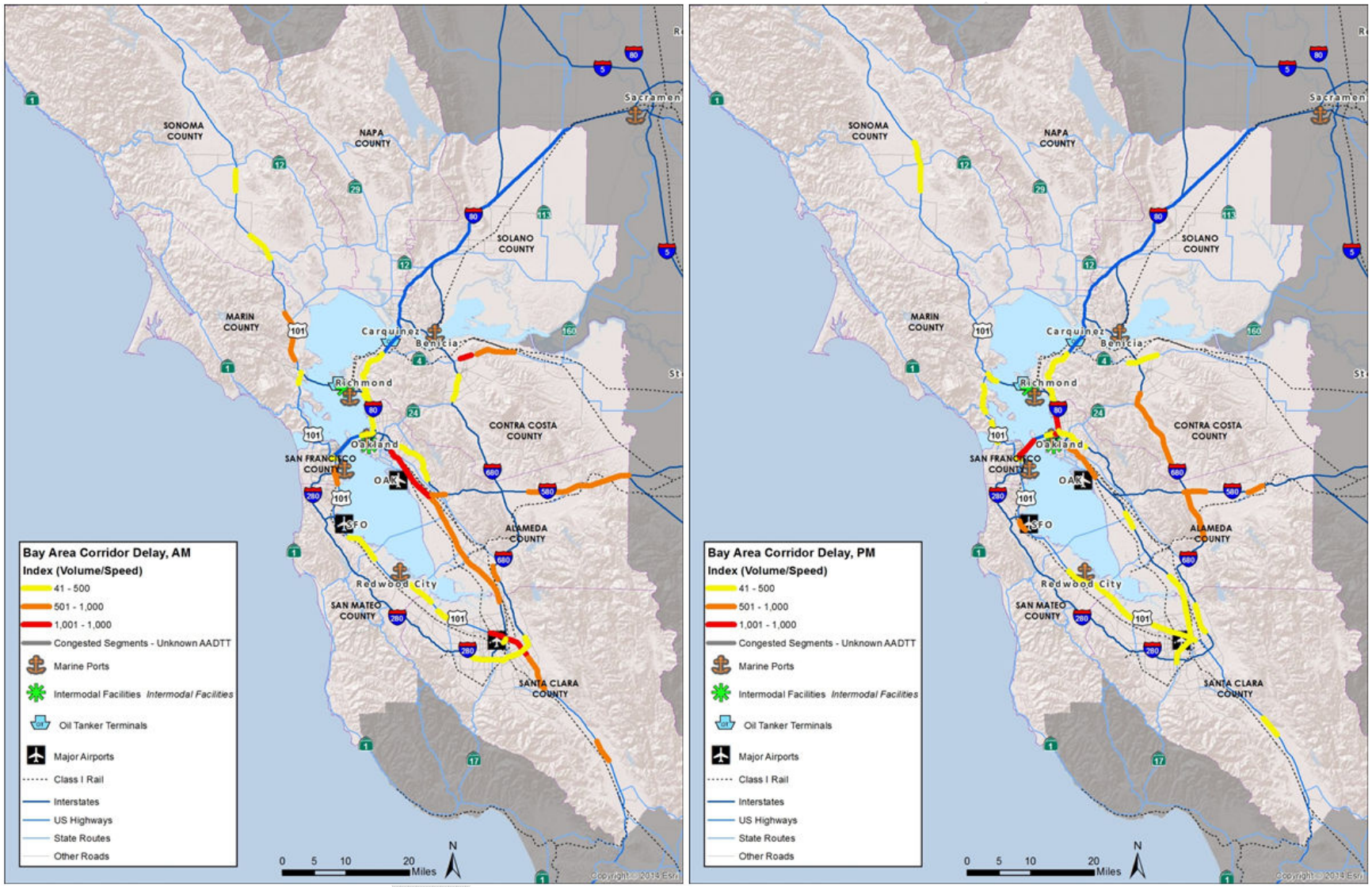
Both highway and railroad corridors provide for shared use between passenger transport and goods movement. Most of the highway corridors experience high levels of peak period congestion and poor reliability with particularly poor performance on segments of I-880, I-80, I-580, U.S. 101, SR 4 and I-680. While trucks generally try to avoid peak periods, the trips of trucks traveling on these corridors are long enough that it has become increasingly difficult to avoid the peak. On the roadway system, there are a number of locations along I-880 and I-580 that have particularly high levels of truck involved crashes that may be related to operational deficiencies in the corridor.

The rail system, with the exception of the busiest portion of the UP's Martinez Subdivision from Oakland to Richmond, has sufficient capacity for the near term. But growth in freight rail and the desire for commuter rail service expansion will strain capacity in the future. While incidents at railroad crossings today are relatively low, this situation should be monitored as rail volumes increase.

5.2.1 Highway Capacity and Congestion

Traffic congestion is one of the most prominent issues in the Bay Area. Truck delays increase the costs of goods movement and can also result in increased truck emissions. In the AM peak period, locations along I-880 from I-238 to the Port of Oakland, SR 4 between Port Chicago and I-680, U.S. 101 through San Jose, and I-580 westbound close to Livermore experience high levels of truck delay delays. In the PM peak period, truck delay is worst along I-680 northbound near Fremont, I-580 around Livermore, and I-80 going from Emeryville to Albany – all major commuter routes. In the future, these same locations will continue to be key bottleneck areas, given existing anticipated levels of growth built in the model. Figure 5.4 shows the highest delay segments in the AM and PM peak periods.

Figure 5.4 Bay Area Corridor Delay and Congested Segments



Source: Congested Segments from INRIX 2013; Truck Volumes data from Caltrans Truck Counts, 2012; Analysis by Cambridge Systematics, Inc.

5.2.2 Highway Safety and Reliability

In addition to recurrent delay, or predictable delay, non-recurrent delay is also important to understand as it is mostly caused by traffic incidents. Highly variable travel times due to non-recurrent delay is particularly problematic for truckers because it affects on-time performance and in some cases may penalize shippers for poor reliability of service. Non-recurrent delay for trucks can be measured by a reliability index that looks at the buffer time (the amount of extra time truckers need to build into a trip in order to ensure on-time performance most of the time) and truck vehicle miles on segments. The corridor segments with the poorest reliability for trucks include:

- I-880 (through Hayward and Union City in the AM peak period and from Hayward to the Port of Oakland in the PM peak period);
- U.S. 101 from Santa Clara to San Jose (AM peak period); and
- I-580 from I-205 to I-680 (AM peak period).

Portions of U.S. 101 on the Peninsula and I-680 north of I-580 also have poor reliability, primarily in the PM peak period.

Looking at safety data more specifically, the worst crash spot is at I-580 WB at I-680 interchange, with 29 truck-involved crashes in the five-year period. While there have been significant interchange improvements on I-880, the large number of safety hot spots suggests that additional improvements are needed.

5.2.3 Truck Driver Shortage

As freight volumes and demand continue to grow, all modes of freight will be required to convey goods. As a result, a variety of labor skills and occupations, including truck drivers, will be needed. Currently (and historically) the trucking industry faces challenges to hiring and keeping drivers. The recent recession may have exacerbated this trend along with retirements of aging drivers and new, stricter health and safety regulations. Poor working conditions (driving for long hours, erratic schedule) also make the field unattractive. The American Trucking Association reports that between 30,000 and 35,000 driver jobs go unfulfilled each year.

This issue arose during stakeholder interviews; FedEx noted a lack of reliable delivery persons. The Alameda County Workforce Investment Board has studied industry clusters that are facing new trends related to the workforce, and in their recent Industry Data Briefing (June 2014) drivers and truckers that support the transportation logistics industry were studied. That report reviewed demand for drivers and truckers in the region by the number of online advertisements received by the occupations. During the fourth quarter of 2013, the Bay Area received 1,045 on-line advertisements for driver-related occupations. Tractor and trailer drivers received 639 advertisements alone, representing 61 percent of all advertisements received in the driver occupation class. Though statistics are not available, it is likely that

many of these positions are not filled based on anecdotal evidence. It is clear in the future that a combination of strategies must be adopted to fill the driver shortage gap.

5.2.4 Rail Corridor Capacity and Connectivity Needs

Currently, the existing railroad network has sufficient capacity to accommodate current train volumes without excessive delays. The UP Martinez Subdivision between Richmond and Oakland is the most constrained segment in the region. Adding more trains to this segment of the network may result in unstable operating conditions seriously degrading *Capitol Corridor* on-time performance as well as intermodal trains moving to and from the Port of Oakland.

The plans for the Oakland Army Base redevelopment is one major driver of changes in rail volumes and flow patterns. It is likely that the UP will carry its premium services (intermodal) on the Martinez Subdivision and the heavier bulk and manifest traffic on the Oakland and Niles Subdivisions accessing the Port of Oakland from the south, as separating these two types of freight traffic generally results in more efficient operations. In 2020, the planned future growth in train volumes for freight and passenger services degrades the overall network (Figure 5.4). Only a segment of UP Coast Subdivision between Newark and Oakland and the segment of UP Niles Subdivision between Newark and Niles Junction are operating at Level of Service (LOS) C. The Martinez Subdivision, with the highest volumes, will degrade to LOS E (Table 5.1). Beyond 2020, the LOS on all of these lines will be further constrained and new capacity will be needed, particularly on the routes in and out of Oakland. In planning the rail system of the future, rail planners will need to consider where right-of-way exists that can accommodate additional track and sidings and the railroads will need to change their operations to take advantage of all the available capacity in the system to ensure that they are able to meet future customer needs. Existing rail LOS is shown in Figure 5.5.

There are also a number of connectivity and operational issues in the Bay Area rail system. In Solano County, there are a number of locations where switching operations that are necessary to access industrial customers have to take place on the mainline due to insufficient industrial spurs and leads. This has the effect of reducing capacity and increasing travel times for both passenger and freight trains. There are also an increasing number of industrial shippers in the North Bay and on the Peninsula (near the Port of San Francisco) that would like to use or expand their use of rail to meet transportation needs, but the costs of building new industrial spurs is very high. Some states provide industrial development grants and loans to rail-served industries for this type of improvement and this approach might be beneficial in the Bay Area.

Table 5.1 Rail Lines 2020 Forecast LOS

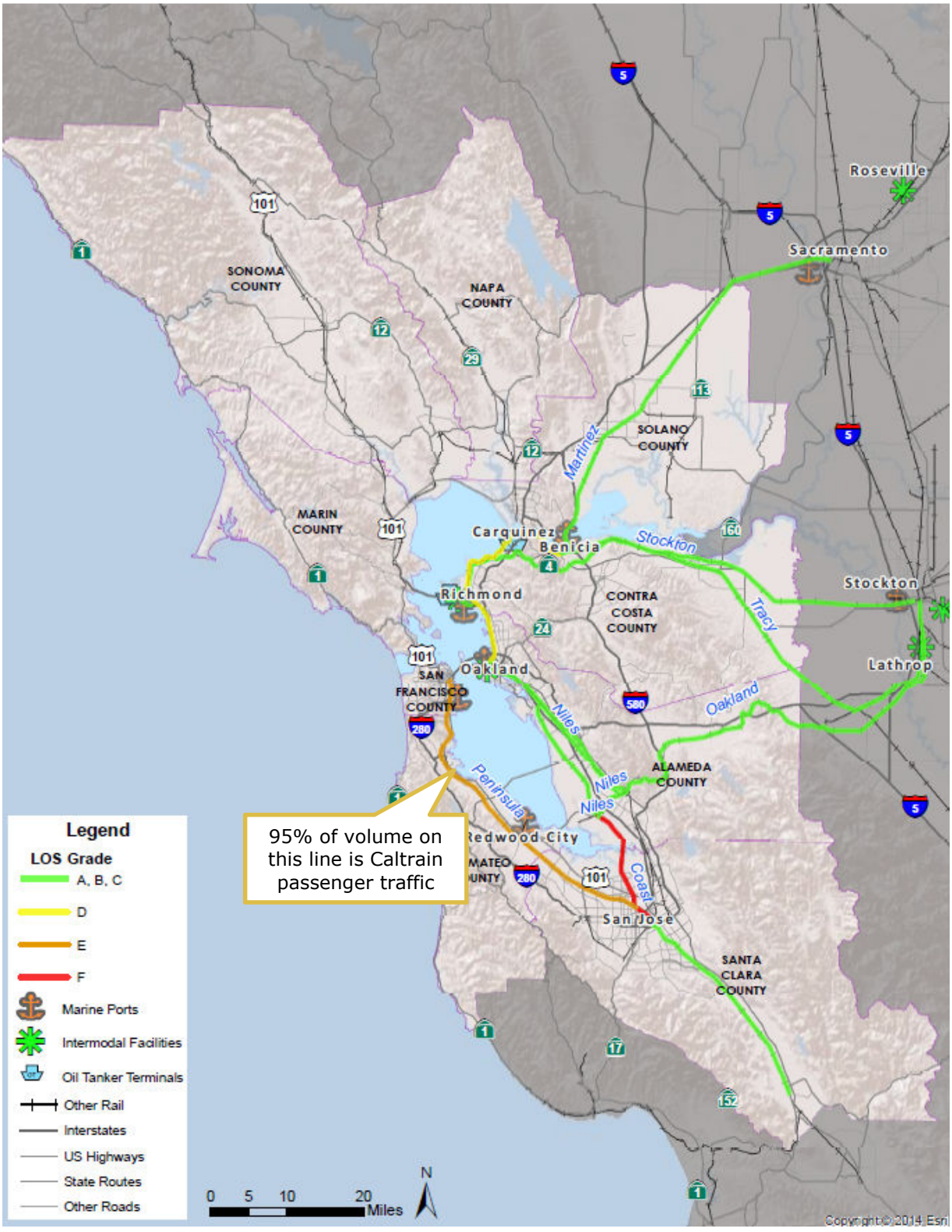
Subdivision	From:	To:	Number of Main Tracks[a]	Daily Freight Trains	Daily Passenger Trains	Total Daily Trains	Average Capacity	Volume/ Capacity Ratio	LOS
UP Coast	San Jose	Newark	3/1	10	32	42	30	140.0%	F
UP Coast	Newark	Oakland	1	8	2	10	18	55.5%	C
UP Coast	Gilroy	San Jose	2/1	4	8	12	30	73.3%	D
Caltrain Peninsula	San Jose	San Francisco	4/2	6	114	120	100	120.0%	F
UP Martinez	Sacramento	Martinez	3/2	22	34	56	75	74.7%	D
UP Martinez	Martinez	Richmond	2	22	44	66	75	88.0%	E
UP Martinez	Richmond	Emeryville	3/2	30	44	74	75	98.7%	E
UP Martinez	Emeryville	Oakland	2	30	42	72	75	96.0%	E
UP Niles	Niles	Oakland	1	2	24	26	30	86.7%	E
UP Oakland	Niles	Stockton	1	11	12	23	30	76.7%	D
UP Tracy	Martinez	Port Chicago	1	4	8	12	30	40.0%	B
BNSF Stockton	Stockton	Port Chicago	2/1	12	10	22	30	73.3%	D

Source: AECOM and Cambridge Systematics calculations.

[a] The split numbers indicates that along the subdivision there are different number of tracks. If 3/1 is indicated, it means the route is mostly triple tracked, with some locations that are single tracked. The same logic follows for other subdivisions.

[b] These numbers are for existing conditions. Future forecasts not available.

Figure 5.5 Bay Area Rail Existing LOSs



Source: AECOM and Cambridge Systematics, Inc.

5.2.5 Rail Corridor Impacts on Communities

The rail system interacts directly with the roadway system where roads cross railroad tracks at-grade. At-grade crossings introduce safety concerns (risk of derailment, emergency response time), and traffic delay issues to the overall transportation system. Crossing safety and traffic delay (including to buses) are related to both roadway traffic volumes and the number of trains using the route. Generally speaking, as traffic and train volumes increase, so do the number of accidents and the amount of traffic delay. To understand the amount of traffic volumes on the railroads, crossing on the Niles Subdivision, the Martinez Subdivision, and the Coast Subdivision south of Newark were looked at. Generally speaking, there are very few crashes happening at at-grade rail crossings. The worst locations are located in in Oakland at locations such as High Street and 29th Street.

In addition, Federal regulation requires locomotive horns be sounded for 15 to 20 seconds before entering all public grade crossings. Though this is created to ensure public safety, it also creates noise impacts on adjacent communities. As such, public authorities are provided with the option to establish quiet zones, granted that certain criteria are met.

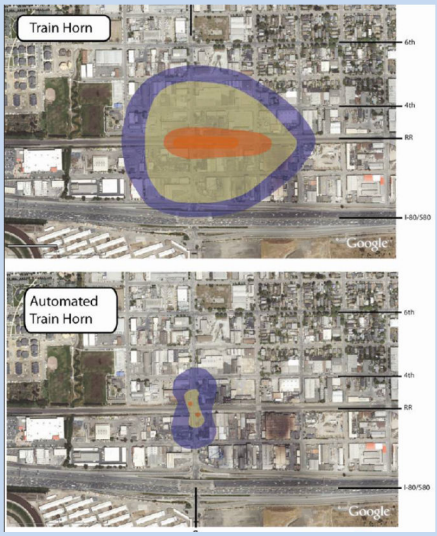
Given that the Martinez subdivision (along the I-80 corridor) has the highest volumes and traverses many residential neighborhoods, a detailed case study was done to document community impacts along the I-80 rail corridor, including noise impacts, as outlined in *Case Study 2: I-80 Corridor Rail Impacts.*

5.2.6 Preserving Freight Corridors for Industrial Access

Critical freight corridors, where much of the rail infrastructure is located as well as parallel major interregional and intraregional truck corridors, also tend to have the greatest concentrations of transit infrastructure. Many of these freight corridors pass through Priority Development Areas. The combination of increasing freight movements through these corridors and increased residential and commercial development is leading to land use conflicts that will need to be addressed with guidance to cities for how to effectively buffer communities from freight activity. Other strategies, such as rail quiet zones, are also important for addressing conflict and freight corridors.

Case Study 2: I-80 Corridor Rail Impacts

The UP and BNSF rail lines along the I-80 corridor through northern Alameda County and West Contra Costa County from the Port of Oakland to Richmond through Emeryville, Berkeley, and Albany carry 24 freight trains and 42 passenger trains per average weekday, as well as serving the Port of Richmond and the Chevron refinery. At-grade crossings regularly cause 20-minute traffic delays on local streets. The UP line currently operates at 88-percent capacity and projects a 4-percent annual growth rate in freight traffic for the next 10 years, as well as 2 to 6 additional daily passenger trains. This will severely affect grade crossings and passenger rail on-time performance for both the Capitol Corridor and San Joaquin lines.



- **Noise impacts.** Federally required train horn soundings at-grade crossings disrupt quality of life for nearby businesses and residents at all hours. Federal regulations allow local jurisdictions to establish Quiet Zones with sufficient safety measures installed, including four-quadrant crossing gates to block drivers and, optionally, wayside horns that focus warning sounds on affected drivers rather than the wide area broadcast of train-mounted horns. A quiet zone program is recommended as a strategy in this plan to address noise impacts.


Wayside Horns


Four-Quadrant Gates

- **Disruption of access and traffic delays.** The grade crossings in the corridor with the highest traffic delay and impacts to local circulation in Alameda County are Gilman in Berkeley and 65th St in Emeryville. At Gilman, queues during peak hours can block vehicle movements along frontage roads and I-80 freeway ramps and 4th St intersections. The physical barrier of railroads obstructs pedestrian and bicycle circulation, as well as car traffic. Constructing grade separations could largely solve these problems, and are planned in several locations by the affected cities. Additional grade separation or grade-crossing improvements are recommended as part of this plan under the grade-crossing improvement program.

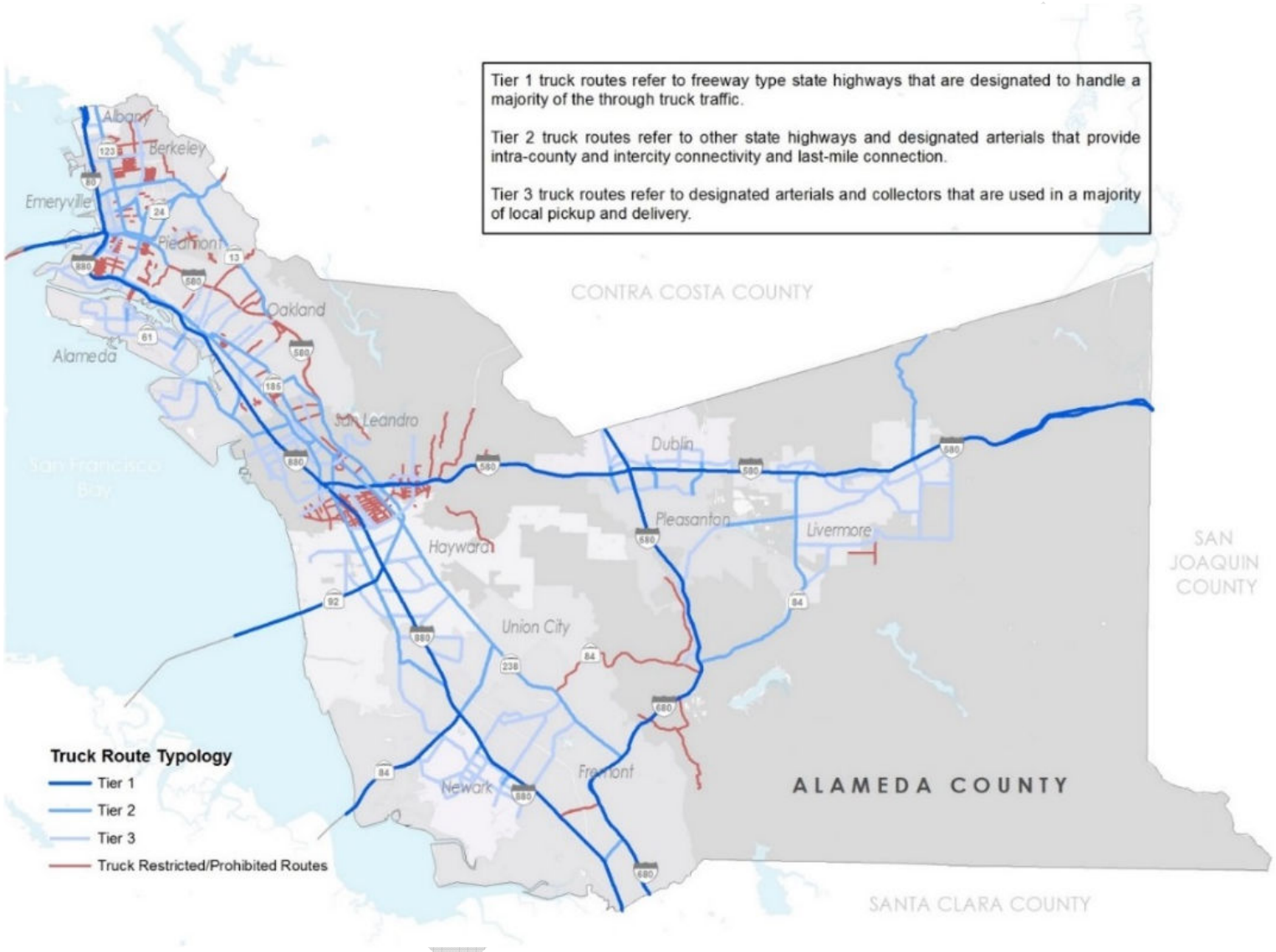
- **Safety impacts.** About 28 rail-related accidents with cars, trucks, bicycles, and pedestrians occurred between 2000 and 2014 in the corridor, including five fatalities. Grade separation is recommended particularly at Gilman and one of the north Emeryville crossings, but is largely contingent upon allocation of Measure BB funding without identified municipal funding sources.

Overall, the Plan includes several new programs that would provide prioritize grade-crossing improvements, including safety upgrades, grade separations, and the creation of Quiet Zones to reduce the impacts of increased train traffic on communities.

5.3 Local Streets and Roads

A substantial amount of goods movement occurs on local streets and roads throughout the Bay Area. Local streets and roads are operated and maintained primarily by the cities, and as such, are not planned as a countywide system. However, local streets and roads provide distinct functions and affect the goods movement system as a whole. The key issues identified with local streets and roads include connectivity gaps, modal conflicts, land use conflicts, and truck parking issues. These issues were studied in more detail for the Alameda CTC Goods Movement Plan but the findings of that analysis have broad applicability throughout the region. As a result, a number of the strategies that are included in this Plan are based on the analysis conducted by Alameda CTC. Figure 5.6 shows the truck route network in Alameda County, which includes local Tier 3 truck routes.

Figure 5.6 Alameda County Truck Routes and Truck Restricted/Prohibited Routes, 2014



Source: Various Cities in Alameda County, Cambridge Systematics, Inc.

6.0 The Regional Goods Movement Plan – Opportunities for the Bay Area

In order to address the needs, deficiencies, and gaps in the Bay Area's goods movement system, a wide variety of strategies – projects, programs, and policies – were proposed and evaluated using the performance measures developed for this plan. Highly rated strategies were then combined into "opportunity packages" to organize and articulate the core priorities of the Plan and show how different strategies can be coordinated during implementation. This organization should also help MTC and partner agencies communicate the important objectives of the Plan to outside funding agencies and policy-makers at the state and Federal level. This will help focus future advocacy and make a stronger case for the investments and policies required to deliver each opportunity package. These considerations are described in more detail in Chapter 7.

A key element of the opportunity packages is the concept of the "balanced portfolio." Each strategy was evaluated against the performance measures developed for the plan and only highly rated strategies are included in the final packages. However, a strategy may have a very high rating on one performance measure but might perform poorly on another. The goal of assembling the strategies in packages is to ensure that the package as a whole performs well with reference to all of the performance measures and that strategies may be combined to offset the poor ratings of one strategy with positive ratings by another. This is the idea of "balancing the portfolio."

6.1 Opportunity Package 1. Sustainable Global Competitiveness

Support environmentally sustainable investments at key global gateways that create local jobs, protect the community and attract international commerce.

Creating Local Jobs. Today, the Port of Oakland supports an economic ecosystem estimated to provide 73,000 middle-wage jobs throughout Northern California. Continuing investments in the Oakland Army Base Redevelopment/Port of Oakland to improve access and support rail expansion will grow local, middle-wage jobs and support needed job diversity in Alameda County. Attracting these jobs to the County could help address the erosion of middle class jobs the county and Bay Area has seen with the loss of traditional manufacturing.

The redevelopment of the Oakland Army Base provides a unique opportunity to build a modern logistics center, provide good jobs for residents and adopt goods movement technologies and operations practices that reduce impacts on adjacent neighborhoods. Retailers and other companies engaged in the expanding e-commerce sector prefer West Coast locations for receiving and fulfilling orders for same day or next day delivery. Few locations on the West Coast offer the availability of seaport, airport, highway, and rail options with land for the development of new logistics facilities that is available around the Oakland port complex. Transportation agencies should coordinate with the Port of Oakland and industrial developers to ensure that investments are made to improve velocity and throughput on the landside at

the Port, create good domestic connections for inland distribution, and ensure that warehouse and industrial development emphasizes value-added services such as import cargo transloading to promote job growth and diversity. The 2012 Addendum to the Oakland Army Base Redevelopment Environmental Impact Report estimated that over 2600 direct jobs would be created by the new logistics facilities.

Supporting the local community. One of the most important aspects of this opportunity package is to reduce existing impacts on communities as well as reducing the likelihood of additional impacts that can result from growth. Historically these impacts have included public health effects associated with diesel pollution, noise from trucks; trains, and port activities, and nuisance and safety effects from spillover truck traffic in adjacent neighborhoods. These impacts are greater in communities immediately adjacent to global gateways (including roads with high-truck volumes, rail lines, ports, airports, and goods movement terminals) and many of these communities are low income communities with high concentrations of minority groups. These are also communities that the BAAQMD's CARE program has determined have the highest Pollution Vulnerability Indices (PVI) in the region.[9] This opportunity package includes strategies that would reduce these impacts below current levels. Public and private entities should adopt the wide range of emerging technologies and operating practices for rail, trucking, and cargo handling to significantly reduce emissions from logistics operations. Projects including demonstrations, equipment purchase subsidies and financial incentives, and full-scale adoption of technologies will be necessary to support this program of investments. Public agencies, including local and regional transportation agencies, state agencies providing Cap and Trade grants, and Federal agencies supporting technology research and development (R&D), will need to provide funding for demonstrations and may need to provide subsidies for equipment purchases. Ultimately, private trucking companies, terminal operators, and rail operators will need to make investments as commercial versions of the technologies become available.

In addition, there should be a program to ensure workforce development and local hiring as part of the Army Base Redevelopment project, which will create many logistics-related jobs. This is actually already built into the Army Base project, as the City of Oakland approved a 'local hiring' agreement, requiring that 50 percent of the project's work hours be completed by Oakland residents. Such local hiring clauses ensure that jobs go to those that are in the communities affected, and to a large extent the success of such local hiring programs has been demonstrated already by the Maritime and Aviation Project Labor Agreement (MAPLA). The MAPLA was a Labor Agreement adopted by the Port of Oakland in 2000 designed to ensure project labor stability, the employment of Port Local Impact Area/Local Business Area residents (Local Hire Program), and the utilization of Port-certified small businesses. The Local Impact Area includes the cities of Oakland, Emeryville, Alameda and San Leandro. The Local Business Area includes the counties of Alameda and Contra Costa. To date, MAPLA has generated almost 4.1 million craft hours, 2.4 million of which are performed by workers in the local

[9] *Improving Air Quality and Health in Bay Area Communities*, BAAQMD Program, 2014.

impact or local business areas, surpassing 50 percent. In addition, $141 million in wages were earned by these residents.

Increasing Competitiveness by Improving Rail Access. Strategic improvements to the freight rail system to and from the Port and adjacent logistics facilities will also improve access, reduce highway congestion, and increase the region's competitiveness as a logistics hub. While the private freight railroads should generally be expected to make their own investments in capacity and operational improvements, the potential for wider public benefits means that public sector dollars may need to be leveraged alongside private investments.

Historically, very little domestic intermodal rail traffic has originated or terminated at rail intermodal terminals in the Bay Area. Instead, most of this traffic is loaded or unloaded at intermodal terminals in the Central Valley with truck trips to make the final move to/from the Bay Area. By expanding intermodal terminal capacity at the Oakland Army Base and working with the Class I railroads to change operating practices and encourage greater use of this capacity for domestic intermodal operations, the region could reduce truck traffic on congested I-580 and potentially reduce emissions through use of more fuel efficient (per ton-mile) rail mode in place of trucking. This will require working with the railroads to identify ways to deploy the cleanest available locomotive technologies.

Expanded rail service is recommended on the southern route and not on the northern route. Considering the right-of-way constraints on the Martinez Subdivision (northern route), especially between Oakland and Emeryville, adding more capacity between Oakland and Emeryville would have serious impacts on the community, making this a less desirable option than one that would re-route some of the growth in intermodal traffic to the southern route. Thus, projects along the southern route of Niles and Oakland subdivisions are recommended in the package instead.

Expanded rail service to/from Oakland can also benefit other ports in the Bay Area by improving rail capacity for bulk commodity exports that all of the ports can take advantage of. Analysis conducted for the goods movement plan has identified exports of bulk commodities (including scrap and recycled products, construction materials, agricultural products, and mineral ores) as major growth opportunities and the ports of San Francisco, Redwood City, Richmond, and Benicia are all investing in terminal expansion to capture this growth. In addition to jobs loading and unloading cargo, bulk exports also create opportunities for local processing activities and contribute to job diversity. These products would be unlikely to move to the region by truck so this is increased economic activity not diversion of cargo from trucking to rail. This increased rail traffic could result in a need to increase mainline as well as terminal capacity.

Figure 6.1 is a graphical illustration of this strategy. The last scenario that represents the transload import market under the global competiveness package shows elimination in truck trips on I-880 and I-580 compared to today.

Figure 6.1 Graphic Illustration of Rail Strategy

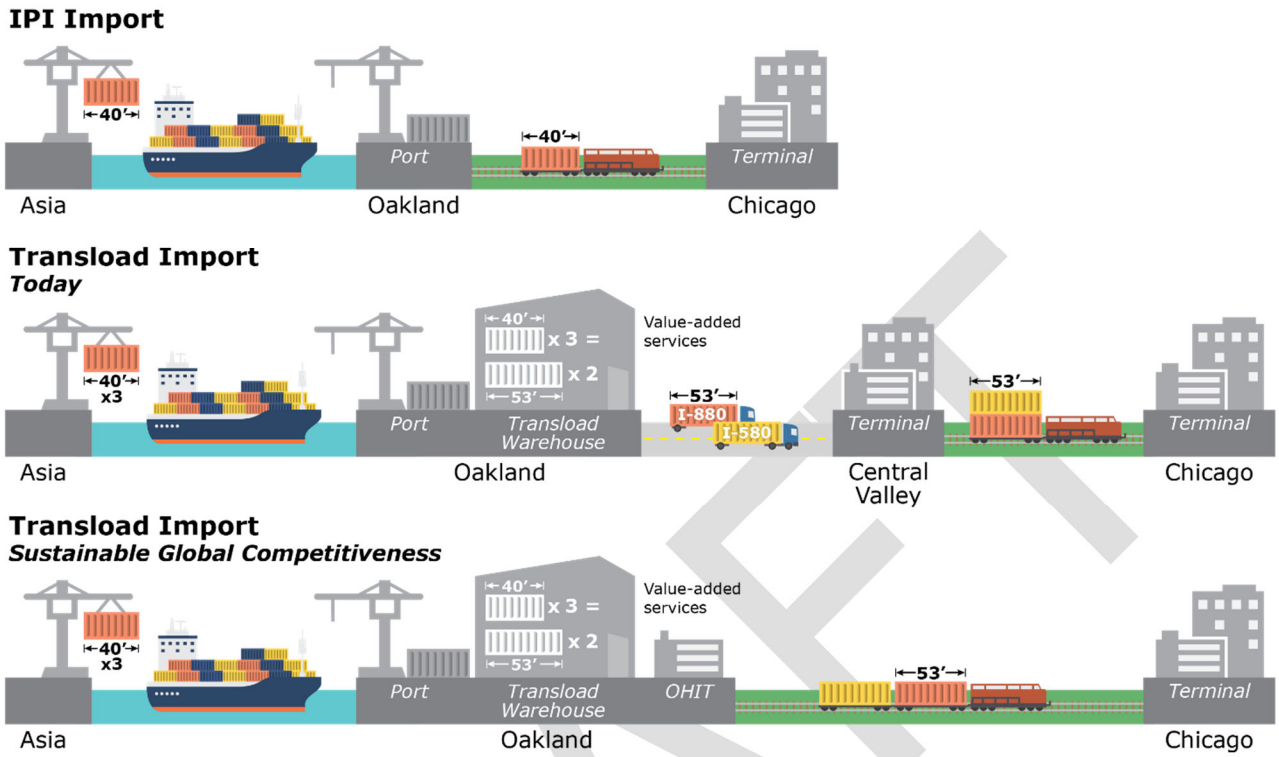


Table 6.1 summaries the strategies recommended for this opportunity package. While the vast majority of strategies in this package will create positive benefits for the region, several projects are indicated to have negative quality of life impacts. These projects either have mitigation measures built into them to overcome the negative impacts, or have complementary projects that will resolve any negative impacts. Detailed explanations for how the impacts will be addressed are included as footnotes.

The Rail Strategy

A major objective of the Sustainable Global Competitiveness package is to promote collaborative investment in the seaport and rail system in partnership with the private sector to provide the necessary capacity to support increased transloading of imports at the Port of Oakland and Oakland Global Logistics Center. The Oakland Army Base (OAB) Phase 2 project will provide increased warehouse and logistics space, some of which will support transloading activities. The Oakland Army Base redevelopment includes the construction of modern transload warehouses. Transloading has been a growing component of modern logistics strategies, and shippers look for the availability of transloading services in close proximity to gateway ports. Thus, the development of transload warehouses within the port complex will make shipping through the Port of Oakland much more attractive and will help ensure the success of the Army Base redevelopment project.

At the present time, the Class I railroads handle very little transload import traffic in Oakland because transloaded cargo is loaded into domestic containers or trailers, and both railroads handle this type of equipment at their intermodal terminals in the Central Valley. This creates truck trips from Oakland to the Central Valley (as well as return trips) along the I-880 and I-580 corridors. So if the Oakland Global Logistics Center is successful in attracting transload business, it could increase truck traffic on I-580. If transload cargo were handled in Oakland, it would eliminate these truck trips helping to reduce congestion, GHG emissions, and criteria pollutant emissions. Public investments in the private rail system could be used as leverage to convince the railroads to collaborate on changing their operating practices to accept transload cargo in Oakland.

Increasing foreign transloading activity handled by rail at the Port of Oakland would have substantial benefits, including:

- Elimination of 21 million truck vehicle miles traveled (VMT) per year.
- Annual savings to shippers in reduced trucking costs of approximately $59.2 million.
- Elimination of more than 1,280 truck trips per day on I-580 and I-880. Assuming that each truck is the equivalent to 2.5 passenger cars (PCE), the reduction in PCE from this strategy would be approximately 3,200 per day.
- Increased middle-wage jobs from transloading and associated value-added activities.
- Shorter truck trips than those now going to the Central Valley that would be more likely candidates for zero-emission technologies (in light of potential range limitations

Over time, there will be a need to increase intermodal terminal capacity (i.e., railyard lifts) in Oakland to handle the increasing volumes of rail traffic, and to grow the share of cargo that is handled on rail instead of truck at the Port of Oakland from 21 percent of total cargo throughput to 40 percent. This strategy also will require increased capacity on both the northern and southern rail routes into Oakland. Expanding intermodal terminal capacity at the Port of Oakland is one of the projects included in the Sustainable Global Competitiveness package. The amount of additional capacity that is needed to realize the goals of this package will require further study, and this additional study has been proposed by the Port. The capacity analyzed for the Oakland Army Base Environmental Impact Report (EIR) may exceed what is necessary if the transload strategy is successful, because use of 53-foot domestic containers in place of 40-foot foreign containers requires fewer railyard lifts. One strategy for using this excess capacity that was evaluated in this plan would be handling more domestic intermodal cargo at this terminal. While this could reduce truck traffic on I-580, it might increase traffic near the Port and West Oakland. The Port also has restrictions on the amount of domestic cargo that can be handled at its facilities. In light of the equity concerns that this strategy raises, it is not recommended at this time. Other options, such as a rail shuttle to move containers from the Port to Central Valley distribution centers and exports from Valley shippers to the Port of Oakland could be beneficial to all stakeholders. A study of these rail market opportunities has been proposed by the Port and is recommended for this Plan.

Table 6.1 Opportunity Package 1 Strategies

ID	Project Name	Project Description	Performance Across Goal Areas: Interconnected/ Multimodal	Safe and Reliable	Innovative	Economic Prosperity	Improved Quality of Life
C1	7th Street Grade Separation Projects (East and West)	These projects will grade separate 7th Street to eliminate the at-grade railroad crossings, which cause significant traffic backup throughout the port area.	●	◒			◒
C2	Oakland Army Base Phase 2 improvements (Port Development)	This project includes building of new warehouses, upgrade of utility infrastructure, access road, gates and intersection improvements at Martime Street and 14th Street.	●			●	⊙a
C3	Oakland Army Base Phase 2 Intermodal Rail Improvements	This project will increase yard trackage to provide annual capaicty of 900,000 TEU.	●			●	⊙a
C4	Truck Services (including truck parking) at Oakland Army Base	This project will include additional parking beyong those mentioned as part of the Army Base Phase 2 project. It will only be implemented after reassessment.	◒			●	●
C5	Replace Adeline overpass at 3rd Street in Oakland to Accommodate Overweight Trucks	This project will reconstruct the Adeline Street bridge to upgrade it to current seismic standards, reduce its grade to allow for better truck operations, and provide a separate bicycle path.	◒	○			
C6	ITS Improvements to Address Queuing at Interchanges along I-880 and on Local Streets to Port of Oakland	This inlcude freeway reductions strategies around I-880 near the Port of Oakland along Local Streets to reduce queuing.	●		●		○
C7	Airport Perimeter Dike (OAK)	This project provides flood and shoreline protection to the Airport's main passenger and cargo runway, parts of which are below sea-level.	●	●		◒	◒

ID	Project Name	Project Description	Performance Across Goal Areas: Interconnected/ Multimodal	Safe and Reliable	Innovative	Economic Prosperity	Improved Quality of Life
C8	Rail Quiet Zone Program	This program will assess the suitability of locations, prioritize locations, design, and address implementation of quiet zones.	◒		○		●
C9	An Initial Demonstration Followed by Targeted Incentives to Promote Adoption of Zero and Near-Zero Emissions Truck Technology for Port Drayage	The program will initial conduct feasible applicationsof zero emission trucks with an intent to identify incentives for market development.	○		●	◒	●
C10	Rail and Terminal Emission Reduction Program	This program will assess rail and terminal emissions, including potential voluntary adoption of Tier 4 standards for locomotives by railroads, as well as incentives for using low emission switching locomotives.	◒				●
C11	Freight Corridors Community and Impact Reduction Initiative	This new program would help to fund impact reduction in neighborhoods immediately adjacent to freight facilities, where buffers and freight hub relocation are not possible.	◒				●
C12	Develop/Support Workforce Training Programs for Goods-Movement-Related Jobs (especially transloading and logistics jobs)	This program will support workforce training for goods movement-related jobs in logistics and transloading, especially for residents of areas most affected by goods movement projects.			○	●	
C13	A Program of Rail Crossing Improvements	This include the following projects: • Berkeley Rail Road Crossing Improvements; • Grade Separation over Decoto; • High St/Davis St/Hesperian Blvd Grade Separation; and • Tennyson Rd grade separation.					

ID	Project Name	Project Description	Performance Across Goal Areas: Interconnected/ Multimodal	Safe and Reliable	Innovative	Economic Prosperity	Improved Quality of Life
C14	A Program of Track Additions, Sidings, and New Connections	This program includes the following projects:					
a.	Hayward Double Track (Elmhurst to Industrial Parkway 2nd Track)	This project involves adding a second track on Niles Subdivision between Elmhurst and Industrial Parkway	○				⊙[b]
b.	Niles Junction Bypass	This involves building a new rail bridge over Alameda Creek in Niles Junction to allow movement from Oakland Subdivision at mouth of Niles Canyon to Niles Subdivision.	◓				⊙[c]
c.	Improvement on the Oakland Subdivision East of Niles Junction.	This program involves improvements on the Oakland Subdivision pending approval of ACEforward projects.	Unknown				

Key: ● – High Positive Impact; ◓ – Medium Positive Impact; ○ – Low Positive Impact; ⊙ – Negative Impact

[a] This project was included in the Oakland Army Base 2002 EIR and the 2012 EIR Addendum and mitigation measures were identified for air quality and traffic-related impacts on neighboring communities. These mitigations measures are currently being implemented by the Port of Oakland and the city of Oakland's developer. In some cases mitigation measures are only necessary when construction activities or port/logistics activities grow to certain levels and the measures will be implemented as necessary in the future.

[b] This project would not be subject to a CEQA environmental review because Federal law exempts private railroad projects from environmental reviews if they are conducted entirely within the railroad's existing right-of-way. Impacts associated with increased rail traffic on this line will be reduced through the adoption of the rail crossing improvement and rail quiet zone programs included in this package.

[c] This project will require an EIR because it is a new bridge over Alameda Creek outside existing right-of-way to address potential impacts on the creek. During this review, any necessary measures needed to mitigate impacts on surrounding communities will be identified.

6.2 Opportunity Package 2. Smart Operations and Deliveries

Support technology and innovative operations strategies to improve goods movement, reduce congestion and increase safety on urban and rural roads.

The Bay Area's transportation system is predominately built out, with limited opportunities to build new capacity. To serve the growing demand, the region has been a national leader in the application of technology and demand management strategies. Likewise, the region's goods movement priority should be to support maximum use of ITS, connected vehicles, and other technology solutions to more efficiently use existing roadway capacity. A number of models for the adoption of ITS travel information systems, integrated corridor management systems, arterial Smart corridors, and eventually autonomous truck technology are the subject of experiments and demonstrations for freight applications. Several of these have been supported by grants from the Federal Highway Administration (FHWA) and some are eligible for funding under new programs at the California Energy Commission and the Air Resources Board funded with Cap and Trade proceeds. A regional initiative that brings together the Bay Area's tech sector with technology users and supports demonstrations and early adoption of the new technologies would help wring more capacity out of the existing system.

This package of projects, programs, and policies can be broadened to encompass new technologies and operating practices that will lead to a more sustainable freight system. As noted in all of the other packages in this framework, it is the intent of the plan that any strategy with the potential to facilitate growth in goods movement demand should include components that reduce the impacts of this growth in demand on adjacent communities. This package of projects and programs seeks to go even further, by proactively building partnerships between technology developers, users, and local communities to build a market for innovative technologies and operational strategies that reduce the impact of goods movement on public health and the environment. By embracing this approach, the region should be more competitive in applying for and obtaining funding from the expanding state programs related to Sustainable Freight implementation and the Cap and Trade program.

This package also recognizes that with the focus on Priority Development Areas and dense urban form in the Bay Area coupled with the growth of e-commerce, urban deliveries in residential and commercial neighborhoods will continue to expand and create conflicts on local streets and roads. There are a variety of innovative practices that can be applied to help manage this local traffic and MTC can provide leadership by providing guidance and funding implementation demonstrations.

Finally, a study to understand managed lanes is proposed as an action but not included as part of the package. Over the past 20 years, there has been periodic interest in the U.S. in the idea of truck-only-lanes (TOL) for corridors with high-truck volumes. The benefits that have been suggested include improved freight operations, improved safety, and the potential to more easily adopt advanced technologies such as truck platooning. To date, no significant application of this concept has occurred in the U.S. An in-depth study of the subject was conducted for the National Cooperative Highway Research Program (NCHRP)/National Cooperative Freight Research Program (NCFRP) which provides some useful information on the

potential benefits of TOLs and the conditions under which urban TOLs may be beneficial. In addition, the Southern California Association of Governments (SCAG) has included tolled TOLs in their RTPs for a number of years.

In the aforementioned studies, it has always been assumed that the TOLs would be fully separated lanes and would be additional capacity above and beyond what is currently available. In the SCAG studies, this presented a major obstacle because of the lack of available right-of-way (ROW) along the high-volume freeway corridors. In addition, the tolled TOLs are not forecasted to generate sufficient revenue to cover a significant portion of the capital costs of the facility because the largest share of truck traffic is in the middle of the day when there is less congestion on the general purpose lanes. Similar issues are likely to be present on Bay Area freeways such as I-80, I-880, I-580, and U.S. 101. An alternative that could reduce the cost of creating TOLs would be to use existing high-occupancy vehicle (HOV) or Express Lanes in a managed lanes concept. In these cases, the TOLs could be operated on the HOV/Express Lanes during the off-peak hours, most likely without tolls, or trucks could be allowed to "buy in" to the Express Lanes. The benefits of this type of operation, with and without tolling, and the configurations of access and egress points requires additional study to collect more data on the time-of-day characteristics of truck travel, average speeds, and levels of truck-involved collisions. As a result, this is recommended as a study to be conducted in the future as an option to make more effective use of existing capacity. The appropriate roles and responsibilities of MTC, Caltrans, and the CMAs are described in Chapter 7.

Table 6.2 summaries the strategies recommended for this opportunity package.

Table 6.2 Opportunity Package 2 Strategies

ID	Project Name	Project Description	Performance Across Goal Areas				
			Interconnected/ Multimodal	Safe and Reliable	Innovative	Economic Prosperity	Improved Quality of Life
S1	Off-Peak and Novel Delivery Policy Guidance and Demonstration Program	This program is built to demonstrate off-peak delivery policy and incentives building on New York City research and results of FHWA off-peak delivery demonstration.	●		◒	●	◒
S2	Port of Oakland ITS including FRATIS	This ITS project will leverage the existing communications infrastructure to implement various projects in a phased deployment, appointment-based arrival system.	●		●		●
S3	Oakland Airport Area ITS Project	ITS at OAK will include design and implementation of ITS along 98th Ave and Hegenberger Rd from I-880 to OAK.	○	○	●		◒
S4	Freight Guidelines for Complete Streets Initiative	This program will develop policy, funding, and recommended guidelines design of especially complicated projects in urban centers.	◒	○			○
S5	I-880, I-580 and U.S. 101 Integrated Corridor Management (ICM) Project	This will be similar to the I-80 ICM project and will design and implement Adaptive Ramp Metering (ARM) and Active Traffic Management (ATM) strategies to reduction congestion and provide incident management capabilities.	◒	●	●		◒
S6	Arterial Smart Corridor Program	This is a new program to identify focused truck corridor ITS projects along arterials. ITS applications will be coordinated with existing and other planned local and regional programs.	●	◒	●		○

ID	Project Name	Project Description	Performance Across Goal Areas: Interconnected/ Multimodal	Safe and Reliable	Innovative	Economic Prosperity	Improved Quality of Life
S7	Strategies to Improve Port Operations Including Night Gates and Weekend Operations	This program includes adding more shifts, automation of terminal operationss, and/or other gate management practices while mitigating any potential community impacts.	●		◒		◒
S8	Clean Truck Policy & Program Collaborative (Joint Working Group with Regulatory Agencies, Freight Industry Representatives, and Public Agencies)	This program will include potential local or state policy, such as fleet emission standards, emission trading programs, and other incentives to encourage adoption of clean truck technologies and alternative fuels.	○		◒		●
S9	Near-Zero and Zero-Emission Goods Movement Technology Advancement Program	This is a program to fund and demonstrate Near-Zero and Zero-Emission goods movement technologies. Program could include incentives for engine retrofits to low emission and ZEV technology.	○		●	◒	●

Key: ● – High Positive Impact; ◒ – Medium Positive Impact; ○ – Low Positive Impact

6.3 Opportunity Package 3. Modernized Infrastructure

Support the Bay Area's industry and job diversity by modernizing the road network in industrial corridors, improving safe access to industrial corridors and facilities, reducing land use conflicts along freight corridors, and improving last-mile truck routes and rail connections to existing and emerging industries.

In recent years, the shift in the Bay Area economy towards information technology and services and away from more traditional manufacturing has led to a loss of middle income jobs for residents with lower educational levels. Nonetheless, the region still has a number of key industrial sectors that remain healthy contributors to the expanding economy. Wine production and agriculture in the North Bay are two examples. The region has also experienced growth in new industries that could replace these lost jobs and that take advantage of the region's entrepreneurial excellence. Industries such as biotechnology, artisanal food manufacturing, precision instrument manufacturing, and clean energy technology are all expanding in the Bay Area. In addition, the region is seeing growth opportunities in the application of advanced manufacturing to more traditional industries, again, taking advantage of the region's well-known technology sector. These businesses continue to locate in the region's traditional industrial centers along I-880, I-80, SR 4, and U.S. 101.

While goods movement investments alone are not likely to be the key ingredient in expanding these industry sectors, viable industrial corridors with good local access, multimodal transportation options to meet a wide variety of supply chain needs, and access to interregional highway and rail corridors are important to these emerging industries. It is also worth noting that 71 percent of the region's freight, by value, is moved by truck (and this excludes an additional 6 percent that includes truck drayage to intermodal rail terminals and mail shipments by truck). Safe and efficient truck access to and from the region's industrial corridors needs to be a critical element of the region's goods movement strategy.

The region's historically industrial corridors have also been targets of redevelopment in recent years as the region emphasizes compact development, transit oriented development, and housing production. This means the freeways and local truck routes in industrial corridors can create sources of conflict between trucks and other modes. This has led to a growing number of safety issues in corridors with heavy truck use. High levels of truck-involved crashes have been identified at freeway interchanges and approaches on local truck routes, many of which were designed without consideration of the high level of use by heavy trucks they currently receive.

Safety issues are also increasing on high-speed rural corridors that connect to commuter corridors such as U.S. 101 in the North Bay and I-580 in Alameda County. These roads are still farm-to-market roads that serve the region's wineries and food producers (including the growing organic farm sector) and a number of conflicts between the movements of trucks to and from these roads and the movement of commuter traffic along the roads were identified in this study.

Finally, a number of shippers around the region have indicated a desire to increase rail shipping to replace trucking and could connect to the Class I system through the limited network of short line railroads. A program of assistance to short lines and industrial rail access improvements would help this happen.

Table 6.3 Opportunity Package 3 Strategies

ID	Project Name	Project Description	Performance Across Goal Areas: Interconnected/ Multimodal	Safe and Reliable	Innovative	Economic Prosperity	Improved Quality of Life
E1	Land use guidelines and incentive programs to cities that reduce land use conflicts	This program will coordinate with regional and state efforts to address land use conflicts.	◒				◒
E2	A program of freeway interchange and auxiliary lane projects	These Projects Include: • Improve I-80/I-680/Route 12 Interchange – All Remaining Phases; • Add auxiliary lanes on U.S. 101 between Rowland Blvd and North San Pedro Road, near Port of San Francisco, near SFO, and segments between San Mateo and Dumbarton Bridge; • I-580/Vasco Road interchange improvements in Livermore; • I-880 NB and SB auxiliary lanes between West A and Winton in Hayward; and • I-880/A St interchange improvements in Hayward.					
E3	A program of freeway corridor capacity enhancement or operations improvement projects	These projects include: • Construct a lane on southbound U.S. 101 using the existing median from south of Story Road to Yerba Buena Road and modify the U.S. 101/Tully Road Interchange to a partial cloverleaf; and • Widen U.S. 101 from Monterey Street to Route 129 – project development					
E4	Local road and county road access and safety program on truck routes	This program would provide funding and guidance to address safety and speed issues along rural truck routes. Program should be coordinated with maintenance, rehab, and bridge programs.	●	●			○
E5	Truck Route Coordination Planning/Guidance, Technical Assistance, and Information to Address Truck Route Connectivity, Health and Community Impacts	This program will allow counties to provide planning and technical assistance on truck route planning, and allow MTC to provide coordination to enable that.	●	○	○		●

ID	Project Name	Project Description	Performance Across Goal Areas: Interconnected/ Multimodal	Safe and Reliable	Innovative	Economic Prosperity	Improved Quality of Life
E6	Development of public or public-private truck parking and full-service truck service facilities near major industrial centers (most likely in the Hayward, Union City, Fremont area)	This program will update the findings from the 2008 study on truck parking in Alameda County and extend it to the rest of the region. It will then implement the findings to provide parking in major industrial centers.	●			●	●
E7	Targeted Programs to Encourage Use of Zero-Emission Trucks and Cargo Handling Equipment Particularly in the I-80, I-880, I-580, and SR 4 Corridors	This program extends from the Technology Advancement program and targets freight corridors and facilities in communities with greatest adverse impacts from freight emissions.	○		●	◒	●
E8	Develop/Support workforce training programs for goods-movement related jobs (industry-focused logistics jobs)	This program will support workforce training for goods movement-related jobs that are focused on logistics.			○	●	
E9	Regionwide Freight Signage Program	This program includes signage to encourage the use of designated truck routes and display route choices for specific destinations.	◒	○			
E10	At-Grade Crossing Safety and Grade Separation Policy and Program	This is a program to identify the grade crossings with the highest priorities and seek funding to upgrade them.	◒	●	○		●
E11	Industrial Rail Access Program	A program to support industrial rail users to improve industrial spurs to allow for increased rail usage along locations where there are industrial or agricultural activities.	◒	○			○

Key: ● – High Positive Impact; ◒ – Medium Positive Impact; ○ – Low Positive Impact

7.0 Moving Forward

Implementation of the Regional Goods Movement Plan will require that the region address a number of wider policy and governance issues, including institutional arrangements, public-private collaborations, and funding to deliver new projects and programs. This chapter provides a roadmap for how to move the opportunity packages forward within this wider regional context. Section 7.1 presents an overview of potential partner roles and responsibilities, Section 7.2 discusses the potential role of public-private partnerships, Section 7.3 describes funding opportunities and funding gaps, Section 7.4 describes the implementation of new programs, and Section 7.5 describes methods for continuing the Regional Goods Movement Collaborative with examples from southern California, Washington state, and Chicago.

The chapter closes with next steps for continuing the collaborative to develop an investment strategy and policy commitment around the Regional Goods Movement Plan.

7.1 Coordinating Partner Roles and Responsibilities

Implementing the Opportunity Packages will require substantial regional collaboration and the formation of new partnerships. This section describes models for new institutional frameworks that should be considered for moving the Plan forward. Table 7.1 presents a matrix of key roles for implementation partners, illustrating the complexity of coordinating the advancement of the opportunity packages and the wide ranging partnerships that will be required.

The coordination issues associated with each of the Opportunity Packages are summarized below.

Table 7.1 Key Partner Roles

CMAs	MTC	Cities	BAAQMD	Port of Oakland	Private Sector and Business Organizations	State Agencies	Federal Agencies
• Plan, program and fund projects identified in the Plan • Participate in detailed rail planning study for Port of Oakland, and also detailed managed lane study • Work with business organizations to identify workforce development needs • Prepare program guidelines for programs, such as off-peak delivery programs • Work with MTC, BAAQMD, and state agencies to develop planning and land use guidelines	• Convene regional and mega-regional stakeholders to develop policy commitment and investment strategy for Plan priorities • Plan, program, and fund high-priority projects identified in the Plan & PBA 2040 • Participate in detailed rail planning study for Port of Oakland • Conduct a detailed managed lanes study • Work with CMAs to develop program guidelines for programs, such as off-peak delivery program • Work with CMAs, BAAQMD, and state agencies to develop planning and land use guidelines	• Submit in response to call for projects • Deliver local roadway improvement projects • Manage implementation of off-peak delivery programs • Modify local regulations (e.g., noise ordinances), as needed • Adopt land use changes, Complete Streets guidelines, and truck route guidance	• Identify potential fuel efficiency and emissions reduction potential to establish eligibility for Cap and Trade funds • Provide local funding and coordinate applications and implementation for Cap and Trade funds • Work with CMAs, MTC, and state agencies to develop planning and land use guidelines	• Submit in response to call for projects, project delivery (projects on Port property) • Apply for federal discretionary funds • Conduct detailed rail plan for Port of Oakland • Plan and apply for grants to implement low emission intermodal terminal technologies at Outer Harbor Intermodal Terminal (OHIT)	• Railroads to participate in detailed rail planning study for Port of Oakland; identify capacity needs and fund their share of improvements; adopt Tier 4 locomotives • East Bay EDA and East Bay Transportation and Logistics Partnership work with building owners logistics businesses to participate in off peak delivery hour's programs, and workforce development programs • Identify cost-effective ZE applications and apply for purchase assistance programs	• Provide funding through Cap and Trade, new Trade Corridors and Investment Fund (TCIF) program, grade crossing programs • CalSTA and Governor coordinate negotiations with railroads, regional, and local agencies for passenger (transit and intercity) and goods movement rail projects • ARB/CalSTA to negotiate agreements with railroads to bring Tier 4 locomotives to Bay Area • Deliver identified projects on state highway system • Participate in detailed managed lane study	• Include in NHS intermodal connector designations and provide funding for expanded intermodal connector program • Provide funding for Bay Area goods movement in federal discretionary fund sources • Continue program funding for FRATIS, grade crossing, off-peak delivery program and support new programs such as truck parking • Support national negotiations with railroads to increase pace of adoption of Tier 4 and low emission rail technologies.

Source: Cambridge Systematics, Inc.

7.1.1 Opportunity Package 1 – Sustainable Global Competitiveness

Most of the projects at the Port of Oakland or the Oakland Army Base in this package would be sponsored and executed by the Port of Oakland while programs would support a mix of projects that could be sponsored and executed by the Port, the City of Oakland, the BAAQMD, consortia of community colleges, private developers, and private railroads. In addition to these organizations, funding and further program coordination could be provided by MTC, Alameda CTC, state and Federal agencies. Several major Port projects have been environmentally cleared and the biggest obstacle is funding. While there are funding categories within Alameda County's Transportation Expenditure Plan (Alameda CTC's plan for expenditures of its Measure BB sales tax measure) and other Federal, state and regional discretionary sources can help close the funding gap, these may not be sufficient and other sources will need to be pursued.

Strategies included in this package that address community impacts, such as the demonstration of zero and near-zero technology, the rail and terminal emission reduction program, and the freight corridors community and impact mitigation initiative would need to be implemented as separate programs/projects whose execution would need to be timed to come online as the Port and Army Base projects are delivered. The zero and near-zero emission demonstration program would likely be coordinated by the BAAQMD (with cooperation from the Port) and could be funded through the Air Resources Board Cap-and-Trade Air Quality Improvement Program and Low Carbon Transportation program, which provides funding for incentives to purchase low carbon trucks. Thus, there will need to be a high level of coordination of these two sets of strategies.

Coordinating the rail mainline improvements creates additional challenges. Most of these improvements have been identified as projects in the plans for the commuter rail service providers and some are currently under environmental review (for example, alternatives for capacity improvements on the Oakland subdivision that are being evaluated in the ACEforward program Environmental Impact Statement (EIS)/EIR). The traditional approach to making these types of improvements would be for the commuter and intercity rail service providers to negotiate the specific improvements with UP and the additional train slots that UP would accommodate when the improvements are completed. Then the commuter rail service providers, through their various funding sources, would pay the UP for the improvements. Another approach that is being discussed for future improvements would be what is referred to as a "slotted schedule" in which Caltrans or the service providers would purchase actual schedule slots for an annual fee (a form of user fee) and the UP would use this revenue to make improvements to ensure on-time performance.

The approaches to coordinating rail mainline improvements between the commuter and intercity rail service providers and UP assume the need to make the improvements to accommodate future growth in passenger rail services. However, if future operations of passenger and freight trains are made in a way that the primary benefits of capacity improvements would be for freight (but with at least some associated public benefits), there would be a need to identify other funding arrangements that recognize the private and public benefits distribution in determining how costs would be shared. Funding for improvements

focused on improving freight rail efficiency could be funded and implemented by Caltrans as part of a new Trade Corridor Improvement Fund program (or the Cap-and-Trade program).

Regardless of how the mainline improvements are made and funded, agreements will need to be negotiated with the UP as the owner of most of the track.

A final element of this opportunity package that poses unique implementation challenges is the workforce development initiative. The U.S. Department of Labor has provided a grant to a consortium of community colleges in the East Bay to convene an East Bay Transportation and Logistics Partnership that is bringing together community colleges, workforce development specialists, public agencies, and the private sector to address workforce development needs and to build ongoing collaborative institutions.[10] However, there is no long-term funding source to implement recommendations and the entities that are coordinating the work of this Partnership are generally outside the regular planning, programming, and implementation structure for transportation programs.

Taking all of this into account, there are two main approaches that could be pursued to address the implementation challenges raised by this opportunity package:

- **Develop a formal institutional framework for coordinating implementation.** A formal institutional framework would define the roles and responsibilities of all implementing agencies, specify project priorities and likely timing, identify potential funding sources and whose responsibility it would be to make applications for funding, and would contain some level of commitment from the participants to implement those elements of the package that are within their jurisdiction. The framework would also define how the parties would inform each other and coordinate their project delivery functions.

  In order to create this institutional framework, the primary implementing agencies can pursue one of the following:

  - Create a Joint Powers Authority (JPA) that would allow the partners to delegate authority and provide responsibility for delivering the entire program to the JPA.

  - Create a Memorandum of Understanding among the partners that will spell out the specific responsibilities for project delivery and target funding contributions. The FAST Corridor program in the Puget Sound Region (see sidebar) presents an example of a successful partnership involving private railroads, state, regional, and local agencies to implement a series of grade separation projects and railroad improvements. Taking an approach like this would allow the partnership to include a wide variety of types of members outside of the traditional transportation funding and project deliver agencies.

[10] The East Bay Transportation and Logistics Partnership is supported by a collaboration of 10 community colleges, 5 workforce investment boards, California State University – East Bay and University of California – Berkeley, East Bay Economic Development Alliance, East Bay Leadership Council, Innovation Tri-Valley, and others. The Partnership is part of a U.S. Department of Labor-funded multi-year initiative in the East Bay under the White House's Trade Adjustment Assistance Community College Career Training (TAACCCT) program.

- **Create a focal point at the highest level possible for coordinating rail investments and negotiations with the private railroads.** In order for the Sustainable Global Competitiveness Strategy to work, there needs to be an agreement with the private railroads that operate the freight system as to the overall market objectives, changes in operating practices, and capital investments, the costs of which will likely be shared. An effective strategy will be to elevate this discussion to the state level, most likely involving the State Transportation Agency and the Governor, and incorporate this in the broader statewide rail vision and rail plan.

The FAST Corridor – A Model Rail Strategy Implementation Agreement

The Freight Action Strategy for the Everett-Seattle-Tacoma Corridor (FAST Corridor) is a partnership of 26 local cities, counties, ports, regional, state, and Federal agencies and railroad and trucking interests who came together in 1998 to solve some of the Puget Sound region's most pressing problems. The FAST Corridor program included a large number of grade separation, truck access, and freight ITS projects in a multijurisdictional corridor. The participants signed an MOU that specified the goals of their partnership, created an initial list of projects, created a process for introducing new projects, specified general cost-sharing principles, and stated the intent of each party to deliver the projects within their jurisdiction as funding became available. This approach proved to be very flexible, shifting funding and funding responsibility around for specific projects as existing funding sources were curtailed or new funding sources became available. It also gave all partners a degree of certainty that all of the projects would eventually be delivered and the package would be completed. The fact that it also included private partners makes it a particularly relevant example. Since the inception of the program, the partners have been able to assemble more than $650 million of public and private funds to complete 20 of the 26 projects originally identified.

7.1.2 Opportunity Package 2 – Smart Operations and Deliveries

The Smart Operations and Deliveries opportunity package generally consists of relatively low cost technology and operations strategies. Several of these strategies, such as the off-peak delivery strategy, will require new institutional arrangements and partnerships with members of the private sector who do not generally participate in public sector transportation programs.

The highway and port ITS projects typically involve one or two parties for funding and implementation and a number of existing programs and models exist for development and delivery of these projects, such as the Federal FRATIS demonstration program. These projects can be implemented in the short run. It may be possible to assemble a small program from regional funding sources for project scoping studies and then tap existing ITS program funds for later stage implementation.

The zero and near-zero emission collaborative and the technology advancement program could be led by the BAAQMD, since actual technology development support would be likely to come from their funding sources. However, Southern California provides a model that could be an appropriate coordination tool to consider for implementing the collaborative concept.
Los Angeles County Metropolitan Transportation Authority (LA Metro) has formed a Countywide Zero Emission Truck Collaborative, the purpose of which is to "promote consistency among public agencies in working to catalyze the development and deployment of zero-emission trucks in Los Angeles County." The collaborative includes representatives from the ports, Caltrans, the regional MPO, and the air quality management district. Among other activities, the collaborative is working to establish performance standards, coordinate policies/investments in infrastructure, and is seeking funding for demonstrations. A similar program could be initiated by MTC with similar partner agencies and goals.

7.1.3 Opportunity Package 3 – Modernized Infrastructure

Most of the projects in this package are fairly standard infrastructure improvements on highways or local roads. Typically, these projects can be funded through a variety of Federal, state, regional, and local sources. However goods movement projects often do not receive the same level of priority as more traditional passenger-serving projects and potential sponsors may lack funds to conduct the project scoping and planning activities necessary to define these projects. Caltrans, MTC and the CMAs can encourage development of these projects by supporting initial planning and scoping and ensuring that these projects receive priority in the regional planning and programming process. Caltrans and MTC can also ensure that the performance targets for future state or regional transportation plans take into account the types of needs that were identified in the needs assessment conducted for this plan so that projects that address these needs score higher against these criteria.

7.2 Public-Private Partnerships (P3)

The strategies presented in the opportunity packages provide several opportunities for public-private partnerships for funding and delivering the projects. The projects at the Oakland Army Base Phase 1 are examples of public-private partnerships that support goods movement and there should be similar opportunities for the Phase 2 projects, and potentially the OHIT project, that are included in Opportunity Package #1. To the extent that these projects are turned over to private developers/operators to make the improvements and recoup the investments through revenues from the projects after they are built, this represents an effective approach to public-private financing of the project.

A second type of public-private partnership that will be important for Opportunity Package #1 is partnerships with the railroads, specifically the UP. The UP has established principles for its participation in P3s that clearly state that the railroad should pay for private benefits and the public should pay for public benefits. Parsing how costs and benefits should be allocated can be very challenging For example, the types of mainline capacity improvements that are proposed in this plan on the Niles and Oakland Subdivisions would typically be made by UP with their own funds to serve their customers as they see markets develop. The public sector

may become involved in these types of projects if the capacity is needed to serve passenger rail demand. Determining how much of the capacity is needed for passenger vs. freight rail can be complex and requires detailed simulation modeling. This situation is further complicated in this plan, because the public benefits that are sought are benefits such as changes in operating practices by the UP (to reduce truck traffic by moving certain rail operations from the San Joaquin Valley) or the increased use of low emission locomotive technology. Since these benefits are directly associated with how the UP runs its commercial operations, negotiating the deals may be very challenging.

One promising approach to public-private partnerships with the railroads may be for the public sector to provide funding to projects that have both public and private benefits but where the return on investment (ROI) for the project is not high enough for the railroad when compared to other capital investments they can make in other parts of their system. In a case like this, the public sector contribution (which must be justified on the basis of public benefits) improves the ROI for the railroads by reducing the amount of their initial investment and makes the railroad more willing to invest private money. This approach has been used in the ConnectOregon program, where Oregon DOT uses public dollars to fund non-highway projects and that the UP considers to be one of the better models of public-private cooperation in the country. The public benefits in these projects is often improved operations/capacity that benefits Oregon businesses, reduces their transportation costs by making rail more accessible, and as a result, preserves or expands jobs in Oregon. In most cases, UP still provides most of the costs to undertake the project; the state funds are used to improve the ROI from the railroad's perspective. The ConnectOregon program is able to be funded with state lottery proceeds because the investments bring economic development benefits.

While this model of public-private cost-sharing can be effective for a well-defined project, the challenge presented by Opportunity Package #1 is that not only does it look to the railroad to provide investment capital but it also asks for changes in operating practices. A major element is a program to increase transloading at the Oakland Army Base in order to create new middle-wage jobs and to reduce truck traffic associated with this transloading activity by having this cargo loaded at an expanding OHIT at the Oakland Army Base instead of trucking the cargo to intermodal terminals in the San Joaquin Valley. The railroads may be unwilling to make this change in operations and to partner in the mainline capital investments necessary to support this strategy until they have assurances that there will be sufficient transloading business at the Oakland Army Base. They may want some flexibility to back out of operating agreements if the business at the Oakland Army Base does not grow in the ways anticipated in this plan.

While these challenges are significant, the following elements could support moving this package forward:

- Perform additional detailed market analysis of the transload and domestic intermodal market engaging the industrial real estate developers in the region, third party logistics (3PL) service providers, and beneficial cargo owners (BCOs – or shippers/receivers).

- Engage the commuter rail service providers in the region to ensure that their needs are well understood and included as part of any negotiating strategy.

- Involve the State Transportation Agency and the Governor's office to put the needs of the Bay Area in context as part of a much broader set of negotiations with the railroads taking into account all of the needs of the California rail system.

7.3 Funding Options and Gaps

Securing Federal, state, regional, or local funds for goods movement projects has historically been a challenge, and the projects and programs included in the Goods Movement Plan face a significant funding gap. For a regional perspective, Plan Bay Area includes $292 billion in revenues over the 28-year life of the plan. However, $232 billion is already committed to existing projects and programs, leaving only $60 billion for discretionary spending. A significant portion of the discretionary funding is designated for transit capital and operating programs, pavement and bridge maintenance, and other uses for which goods movement projects are not eligible.

The last major statewide freight investment program was approved by voters in November 2006 as part of the Proposition 1B bond package. That program, the Trade Corridors and Investment Fund (TCIF), totaled $2.5 billion statewide. Over the life of the program, $640 million have been invested in projects that benefit the wider northern California mega-region. Most of the original TCIF funding has been allocated by the California Transportation Commission, with only small amounts available from project savings in the original allocations. As of September 2015, the legislature was in the process of conducting the First Extraordinary Session on Infrastructure. Various funding proposals for TCIF have been included in the discussions, but at this time, no state action has been taken to renew TCIF funding.

In late 2015, President Obama signed H.R. 22, the FAST Act (Fixing America's Surface Transportation Act), establishing funding levels and federal policy for our nation's highways and public transit systems for fiscal years (FY) 2016 through FY 2020. The FAST Act establishes the first-ever federal highway program focused on freight—the National Highway Freight Program—to support investments in the primary highway freight system, critical urban and rural corridors, and other portions of the Interstate system. California expects to receive approximately $582 million in NHFP funds over the five years. The FAST Act also establishes a new competitive program—the Nationally Significant Freight and Highway Projects Program—for projects of national or regional significance. Nationally, the program will receive $800 million in FY 2016, growing to $1 billion by FY 2020

Table 7.1, shown below, describes some of the major existing funding sources and potential future funding sources for goods movement projects and programs.

Table 7.2 Summary of Existing and Potential Future Goods Movement Funding Sources (2016-2040)

Revenue Source	Description	Total Estimate (Millions)[a]	Eligible Uses Relevant to Goods Movement
Current Available Freight-Specific Sources			
National Highway Freight Program (NHFP)	New federal formula highway program focused on freight. Funds are distributed so that each state's share is equivalent to its share of the overall federal highway program. States are required to spend their annual freight funding on projects on the primary highway freight system, critical rural freight corridors, or critical urban freight corridors. Up to 10 percent of a state's total freight apportionment may be spent on intermodal or freight rail projects.	$759[b]	Eligible projects include improvements to the primary highway freight system (defined as the 41,518-mile primary freight network established pursuant to MAP 21), critical rural freight corridors, critical urban freight corridors, and portions of the Interstate system not designated as part of the primary highway freight system. Up to 10 percent of a state's total freight apportionment may be spent on intermodal or freight rail projects.
Nationally Significant Freight and Highway Projects Program	New discretionary (competitive) program for projects of national or regional significance. The bill establishes a minimum grant award of $25 million. Funding is capped at $500 million over the 5-year lifetime of the bill.	$1,392[c]	Funding for freight rail or intermodal projects or projects to facilitate intermodal transfer or access into a freight rail, water or intermodal facility
Other Current Potential Sources (not freight-specific)			
County Sales Tax – Alameda County Measure BB	Voter approved sales tax measure for Alameda County transportation investments. The 2014 Transportation Expenditure Plan (TEP) guides investments. Projected to generate $8 billion in revenues from 2015-2045.	$2633.8[d]	Countywide freight corridors and freight and economic development programs ($238 million) are reserved for freight. Other discretionary sources include funds for railroad corridor ROW preservation and track improvements, other congestion relief, local bridge seismic safety projects, other traffic relief on highways, and technology, development and innovation.

Revenue Source	Description	Total Estimate (Millions)[a]	Eligible Uses Relevant to Goods Movement
Regional Surface Transportation Program (STP) and Congestion Mitigation and Air Quality (CMAQ) funds	Federal transportation revenues administered by MTC and CMAs. Since 2012, MTC has allocated funds via the One Bay Area Grant (OBAG) Program, which supports Plan Bay Area by promoting transportation investments in Priority Development Areas. MTC is currently considering an OBAG 2 program, covering 2017-18 through FY 2021-22 for a total of $790 million.	$529[e]	Highway maintenance, regional active operational management, and regional planning activities.
State Transportation Improvement Program (STIP)	Multiyear capital improvement program of projects on and off the State Highway System, funded with revenues from the State Highway Account and other funding sources. The STIP is composed of two sub-elements: the Regional Transportation Improvement Program (RTIP) and the Interregional Transportation Improvement Program (ITIP).	$358[e]	Eligible projects include state highway improvements, local road improvements and rehabilitation, intercity rail, grade separation, transportation system management, transportation demand management, soundwall projects, intermodal facilities, and safety.
and Trade Funds – Low Carbon Transportation Investments and Air Quality Improvement Program	Supported by Cap and Trade proceeds, each year the legislature appropriates funding to ARB for low carbon transportation projects. In fiscal year (FY) 2015-16 $350 million was allocated for low carbon transportation projects.	$2,500[f]	Funding for low carbon emission trucks and mobile source incentives to reduce GHG emissions, criteria pollutants, and air toxics through the development of advanced technology and clean transportation.
Mobile Source Incentive Funds and Transportation Fund for Clean Air	The Mobile Source Incentive Fund (MSIF) is a BAAQMD program that provides grants to public and private sector for projects eligible for the Carl Moyer Program, vehicle scrappage and agricultural assistance programs, and for projects to reduce pollution from school buses. Fund revenues are collected from a $2 fee on vehicles registered in the Bay Area.	$33 million per year[g]	The MSIF has eligibility and potential application that are same as the Carl Moyer Program. The TFCA has generally been used for demand management types of projects and must be used for on-road sources. It could be used to fund charging infrastructure for electric trucks.

Revenue Source	Description	Total Estimate (Millions)[a]	Eligible Uses Relevant to Goods Movement
	The Transportation Fund for Clean Air (TFCA) revenues are collected from a $4 surcharge fee on vehicles registered in the Bay Area, to fund cost-effective projects that reduce on-road motor vehicle emissions within the BAAQMD's jurisdiction. Sixty percent (60%) of TFCA funds are awarded through the TFCA Regional Fund. The remaining forty percent (40%) of these revenues are distributed to the designated County Program Manager Fund in each of the nine counties.		
Future/Anticipated Sources			
Cap and Trade-Goods Movement (from 40% uncommitted funds)	MTC's Regional Cap and Trade Framework, adopted in 2013, advocates for goods movement investments to compose a portion of the unallocated 40% of these funds. The financial assumptions for Plan Bay Area 2014 assume that approximately 5% of annual Cap-and-Trade revenues would be available for a goods movement program and that the Bay Area share of this would be 10 percent.	$760	TBD, but this is earmarked for freight-specific projects.
Trade Corridor Improvement Fund (TCIF)	Proposition 1B, approved by voters in 2006, and provided $2.5 billion for infrastructure improvements along Federally designated "Trade Corridors of National Significance" or along other corridors within California that have a high volume of freight movement. Of the total funding statewide, Bay Area projects received $481.5 million.	$200-300[h]	Freight projects with statewide significance
Bridge Tolls	The last regional bridge toll increase (Regional Measure 2) was passed in 2004 and has funded various transportation projects determined to reduce congestion or to make	$560[e]	TBD

Revenue Source	Description	Total Estimate (Millions)[a]	Eligible Uses Relevant to Goods Movement
	improvements to travel in the toll bridge corridors. The draft revenue forecast for Plan Bay Area 2040 assumes a $2 increase in FY 2019-20.		
Carl Moyer Memorial Program	ARB funding source with regional funds administered by the BAAQMD. The Carl Moyer Program provides grants to upgrade or replace heavy-duty diesel vehicles and equipment, including on- and off-road vehicles and equipment, school buses, agricultural equipment, marine vessels, and locomotives. This program aims to reduce air pollution from these diesel engines operated in California by public and private entities.	$7 – $10 million per year has been allocated to the Bay Area[i]	While all heavy-duty diesel sources are eligible, this program is primarily used for goods movement. This is an incentive program so cannot be used to demonstrate technology (it must demonstrate lasting emission reductions) and therefore is unlikely to be used for zero emission trucks in the near-term. It could be used to address some of the needs identified for the Rail and Terminal Emission Reduction Program.

[a] Unless noted, all funding sources are based on Plan Bay Area 2040 Draft Revenue forecast, as of October 2015.
[b] Assumes California receives 9% of the national program and the Bay Area receives 15% of California funds.
[c] Assumes the Bay Area receives 5% of funds from this national discretionary program.
[d] This includes the $238 million reserved for freight plus the discretionary funds for railroad corridor ROW and track improvements that could be used to address freight rail needs on shared (passenger and freight) lines, a portion of the local streets maintenance and safety discretionary funds (which could be used to address needs on local truck routes), the portion of traffic relief funds on highway funds allocated to the primary freight corridors in the County (I-80, I-580, and I-880), and the technology, development, and innovation program funds (which could be used to fund ITS and zero-emission technology programs).
[e] For illustrative purposes, the amount listed is 10% of the total from this source in Plan Bay Area 2040 Draft Revenue forecast. This actual amount is uncertain but this represents a reasonable estimate of these funds that could be considered for freight-specific projects over the next 25 years.
[f] This is based on the estimate of the annual allocation of low carbon transportation for 2013-2014, 2014-2015, and 2015-2016. This number is calculated to be approximately $100 million per year, or $2,500 million if extended for 25 years through 2040.
[g] $11 million of this is for the MSIF and it ends in 2023.
[h] This would be a one-time appropriation based on bills currently under consideration. While it is possible that it would be renewed, this is not considered in this table. This is the total amount available in the state. The Bay Area share would be a percentage of this amount.
[i] Authorization of the Carl Moyer Program ends in 2023.[j] This is a one-time appropriation based on October 2015 awards and is to be spent on projects across the nation. It is unclear whether or not there will be future funds available.

Table 7.3 presents a high-level estimate of the total costs, programmed funding, and funding shortfall for the opportunity packages. The table consolidates the programs, projects, and policies into broad categories. These cost estimates are based on submitted cost estimates for projects that responded to recent state, regional, and county plans as well as similar programs in other or sample projects of a similar nature. The table provides only a broad estimate of the current status of the goods movement projects and programs. Moving forward, the plan emphasizes that more funding should be secured to deliver projects and programs across all these categories.

Table 7.3 Cost of Projects and Programs by Category

Million Dollars

Category	Total Cost	Programmed Funding	Funding Shortfall
Gateway infrastructure (incl. intermodal rail)	1,255	283	971
Highway Capacity Improvements	104	97	7
Highway interchange improvements	795	180	615
Mainline rail infrastructure improvements	375	-	375
Technology programs (Highway, ITS, Zero-Emission)	377	13	363
Local truck route improvements [11]	15	-	15
Goods movement planning support	16	-	16
Impact Reduction Program	877	1	876
Grand Total	**3,814**	**575**	**3,239**

Source: Multiple sources, including Measure BB project costs, Plan Bay Area, CWTP, CA Rail Plan and estimates from similar projects.

Funding for these projects can come from a variety of sources but as can be seen from the table the funding gap for these projects is large and the available funding sources are not likely to be sufficient to fund all of the projects. While funding from highway and local roads programs (including STIP and portions of STP/CMAQ) can help provide funding for some of the infrastructure modernization projects in Opportunity Package 3, there is a significant local funding gap for port and rail projects, and this constitutes the largest funding need in Opportunity Package 1. Together, these port and rail projects have unfunded needs of $1.3 billion. Right now, the only local funding that is available for these projects is approximately $348.4 million of Alameda County's Measure BB funds and of this, only $238 million of this is reserved for goods movement projects.

The funding gap for non-highway goods movement projects and programs is the most significant funding issue facing the Regional Goods Movement Plan and will make implementation of Opportunity Package 1 very challenging. Even at the state and Federal

[11] The local truck routes improvement projects are not a focus of the reginal plan and thus a limited level of funding is provided. It is anticipated that local jurisdictions will identify additional local truck route projects.

level, the amount of funding proposed for port and rail projects in new legislation is very limited. This should be a target for future advocacy following adoption of the Regional Goods Movement Plan.

7.4 Creating New Programs

The opportunity packages include the creation of many new programs that will require further definition before their funding requirements can be more clearly defined. There are, however, opportunities for early actions on these programs that can be initiated at relatively low cost. These actions fall into three broad categories:

- Developing guidance documents and technical assistance programs – this would include development of some of the guidance documents specifically called for in the strategies including local land use planning guidance for cities and truck route planning guidance.
- Conducting more detailed scoping studies to identify specific projects that would ultimately receive design and construction funding through larger program allocations in future plans.
- Developing specific project prioritization processes for implementing programs. One example of this would be to develop a more detailed prioritization program for the rail grade separation program. A similar program in the SCAG region has proven successful.

7.5 Keeping the Collaborative Going

For the following reasons, an ongoing collaborative will be important for the success of the Regional Goods Movement Plan:

- Coordinating roles and responsibilities for funding and project delivery: As was discussed previously, the complex multi-jurisdictional nature of the goods movement plan requires a tremendous amount of coordination between public and private partners to ensure all of the funding is in place and that participants with relevant jurisdiction are involved in the planning and implementation at every stage.
- Ensuring that key stakeholders are kept informed of progress.
- Advocating for funding and policy with state and Federal agencies.

Several models from other states and regions are presented for consideration in the following Sections. The Plan closes with some potential next steps for the Bay Area.

7.5.1 Multi-Level Collaborative – The Southern California National Gateway Collaboration

The Southern California National Gateway Collaboration was originally formed by freight stakeholders around the Ports of Long Beach and Los Angeles in response to perceived difficulties in getting projects at the Ports to move through environmental reviews and to get

more of the projects that were needed to address port congestion and growing demand. The original intent was to gather local transportation agencies, the ports, the South Coast Air Quality Management District, and state and Federal resource agencies together to work on how to improve environmental compliance and improve the efficiency of the review process. As the agencies began working with each other they realized there were other benefits that extended to collaborative advocacy for funding and increased visibility of Southern California gateway needs.

As the regional MPO, the stakeholders suggested that SCAG play the role of convener and SCAG also agreed to provide staff support as necessary for the group. The collaborative also operated at two different levels:

- A senior management group that met periodically to review work products, discuss advocacy needs, and to coordinate the actions of their respective agencies. This group included CEO-level participants and included senior government affairs staff from the Class 1 railroads.

- A staff level group representing the key local agencies. This group managed work products, prepared the agendas for the meetings, and coordinated work across their respective agencies.

Over the long run, the working relationships established at the staff level was probably the most useful outcome from this structure as staff from agencies who had to work with each other regularly on project approvals, funding applications, and developing planning documents began to hold regular meetings leading to a much higher level of coordination, data and resource sharing, and "speaking with a common voice" when presenting the case for external investments in the programs in Southern California.

7.5.2 An Information Sharing Forum – The Puget Sound Regional Freight Roundtable

The Puget Sound Regional Freight Roundtable grew out of the FAST Corridor program described earlier, as a mechanism for bringing the private sector to the table and to ensure that the priorities for regional freight programs were embraced by the private sector users of the goods movement system. The Roundtable has continued to meet for over 20 years, and as such is one of the longest standing goods movement collaboratives in the country. The group meets monthly and includes representatives of public and private sector stakeholders. The private sector stakeholders are mostly goods movement industry representatives and the public sector stakeholders include representatives of the state DOT, the regional MPO, cities, and other state and regional agencies. The roundtable is staffed by the Puget Sound Regional Council, the MPO.

The monthly meetings are early morning meetings, which makes it easier for the private sector participants, who might otherwise be spending time away from their business. Each of the meetings has reports on topics of interest to the participants. This could include information on upcoming road closures or transportation projects, status of legislation or regulatory

hearings of interest to the goods movement industry, status of plans and projects, and information about conferences and studies that may be of interest to members. There is usually a report on upcoming legislative actions to inform advocacy.

While the Roundtable does not have a specific program of action, its meetings are very focused on information exchange about actions of both the public and the private sector the impact the participants. Participants continue to be involved because they find the information useful, it helps improve access to the public sector by the private sector, and it provides a platform to organize collective action to respond to important policy issues as they arise.

7.5.3 A Collaborative Public-Private Program to Improve Chicago's Rail System – Chicago Regional Environmental and Transportation Efficiency Program (CREATE)

The CREATE program is a collaboration of private freight railroads, regional public rail service providers, and state, regional, and local transportation agencies that was developed to implement a far-reaching program of improvements for the complex rail system in the Chicago region. During the late 1990s it was becoming increasingly clear that there was a need to make significant capital and operational improvements to the Chicago rail network which is shared by all of the nation's Class 1 carriers, Amtrak, and the Metra commuter rail system. Public transportation agencies and civic groups were concerned about the spillover effect that the rail system problems were having on roadways throughout the region and the impact that a congested and unreliable system could have on the economy of the Chicago region. Between 1999 and 2001, a variety of public and private groups studied the improvements that were needed and while many of the important projects were identified, no consensus on project priorities or how to proceed with implementing a program could emerge. The Mayor of Chicago became personally involved in trying to move the process forward and asked the Surface Transportation Board to bring all of the parties together. This resulted in the creation of a Rail Task Force that brought together the freight and passenger railroads, the Illinois DOT, and Chicago DOT to come up with a plan. This group formed the core of what became the CREATE program.

Over the next several years, the task force conducted technical studies and economic studies, the latter of which provided a basis for understanding the distribution of economic benefits across the public and private sectors. As a result of all of this work, in June 2003, a Joint Statement of Understanding (JSOU) was signed and shortly thereafter, a plan of priority improvements was identified.

The CREATE Program is implemented and managed through a multi-institutional committee structure that was modified in 2007 to include a series of groups with specific roles. Committee membership includes the Association of American Railroads, Chicago DOT, Illinois DOT, the Class 1 railroads who operate in Chicago, and the commuter railroads that operate within the Chicago rail system. All together, these committees and groups make sure CREATE projects are completed on time and on budget, partners continue to advocate for additional funding at all levels (Federal, state, local and private), and communities are informed of the

progress of each project. Some of the key committees that are responsible for implementation and management of the program include:

- **Stakeholder Committee.** The Stakeholder Committee sets policy for the CREATE program and approves any changes in scope or budget.
- **Management Committee.** The Management Committee reviews and approves project designs, project cost estimates, and construction assumptions and makes decisions regarding scope, schedule, and budget based on recommendations from the Implementation Team.
- **Implementation Team.** The Implementation Team tracks budget and construction progress and recommends project changes.
- **Finance and Budget Committee.** The Finance and Budget Committee works with the Advocacy Committee to identify sources of public funds and monitors project cost estimates versus actual expenditures, and assists project managers with financial management issues.
- **Advocacy Committee.** The Advocacy Committee is responsible for all CREATE communications, addressing community concerns, and advocating for CREATE. The committee monitors the Federal and state legislation process and conducts public outreach.
- **Tech Review Team**. This team works with project managers on detailed scope, schedule, and budget issues.

The CREATE approach is effective because it is focused on a specific program of improvements and it includes management and implementation of these programs, it has defined a process for prioritizing projects, it has come up with an initial plan to divide cost responsibility for the projects, it includes a program to actively pursue additional funding (and has been successful in obtaining TIGER grants), and it has an advocacy committee that works with communities and addresses community concerns.

7.5.4 Moving Forward- A Policy Commitment and Investment Strategy for Bay Area Goods Movement

While this chapter has provided a number of examples of collaborative models, the Bay Area and wider mega-region have successfully collaborated in the past on goods movement issues. The Northern California Trade Coalition (NCTC) has served in the past as a forum to prioritize the mega-region's goods movement projects for statewide funding opportunities. Key stakeholders have included MTC, Sacramento Council of Governments (SACOG), San Joaquin Council of Governments (SJCOG), and the Ports. Representation on any future mega-regional group should also include the BAAQMD and the Congestion Management Agencies.

Over recent years, MTC has adopted various resolutions establishing regional policy commitments and investment strategies for other types of transportation improvements, in

particular transit investments (Transit Core Capacity Challenge Grant Program (MTC Resolution 4123), Regional Transit Expansion Program (MTC Resolution 3434)) and discretionary statewide funding sources (Cap and Trade- MTC Resolution 4130). Following the adoption of this Plan, MTC and other regional stakeholders can work to develop a similar model to advocate for the delivery of a number of high-priority goods movement projects, programs, and policies.

MTC can take the lead to convene stakeholders from the Bay Area and the wider "mega-region" to establish a focal point for northern California goods movement policy, advocacy, and funding strategy. This group could help develop principles to guide the Bay Area members in the development of a near-term (5- to 10-year) prioritized list of strategies from the opportunity packages, to coincide with Plan Bay Area's investment strategy in the summer of 2016. Additional projects may be added as appropriate as the mega-region embarks on its future goods movement planning efforts. In 2016, MTC, SACOG, and SJCOG are collaborating on a planning study to improve goods movement and industrial lands access an d efficiency.

Such a prioritization effort should select strategies that maximize benefits across all five of the Plans goal areas (i.e., quality of life, safety and reliability, innovation, interconnected and multimodal, and economic prosperity). Strategies should not be limited to infrastructure projects as the Plan includes a variety of strategies to increase efficiency of freight movements, promote the adoption of new technologies, and reduce local health impacts from freight. These programs are of paramount concern to many of the region's environmental and equity stakeholders, and any future collaborative should work to incorporate these programs into the policy commitment. In terms of health impacts, health impact assessments (HIA) can be helpful tools for considering the potential health effects of policies, programs, and projects, and these studies can further inform prioritization. MTC and its partners will continue to work with the public health community as this process takes shape.

Beyond this initial policy and investment commitment, any future regional collaborative around freight should consider incorporating some combination of important features from all of the national models discussed earlier. These would include:

- Like CREATE, an initial focus on project implementation would be beneficial. This builds on the earlier discussion of a structure for coordinating partner roles and responsibilities around the opportunity packages.

- A memorandum of understanding or some statement of understanding, while not necessarily legally binding, provides an indication of a stronger level of commitment for how partners will participate.

- Having different levels within the committee structure that includes executive level committees as well as staff level working groups (as in the Southern California example) helps build the proper working relationships among key partner agencies.

- An advocacy and funding focus, like CREATE, will be critical for an ongoing collaborative in Alameda County.

- An ongoing information sharing forum that focuses on specific issues where the public and private sectors "touch" each other, as is done in the Puget Sound Roundtable, will help build and foster trust and communications between the public and private sector that is so critical for effective long-term partnerships.

None of the examples provide a model for active engagement of the community in the collaborative process. This is a significant shortcoming that would need to be overcome before adopting any of these models for the Bay Area. There are several ways that this could be accomplished:

- Continue to build from the existing Roundtable structure, but ensure there are regular meetings held outside of normal business hours. These meetings should be short and focused. It may actually be necessary to have more than one type of roundtable – one focused on goods movement professionals and agency staff and a second group focused more on affected communities and staff from the cities in those communities.

- Directly involve community members in the advocacy efforts on behalf of the opportunity packages.

Lastly, as the implementation is developed, explicit consideration will be given to how the implementation plan aligns with other planning efforts, including the California Freight Mobility Plan, National Freight Advisory Committee, and the California Sustainable Freight Action Plan, the most recent ongoing effort resulting from Governor Brown's 2015 Executive Order directing state agencies to improve freight efficiency, transition to zero-emission technologies, and increase competitiveness of California's freight system.