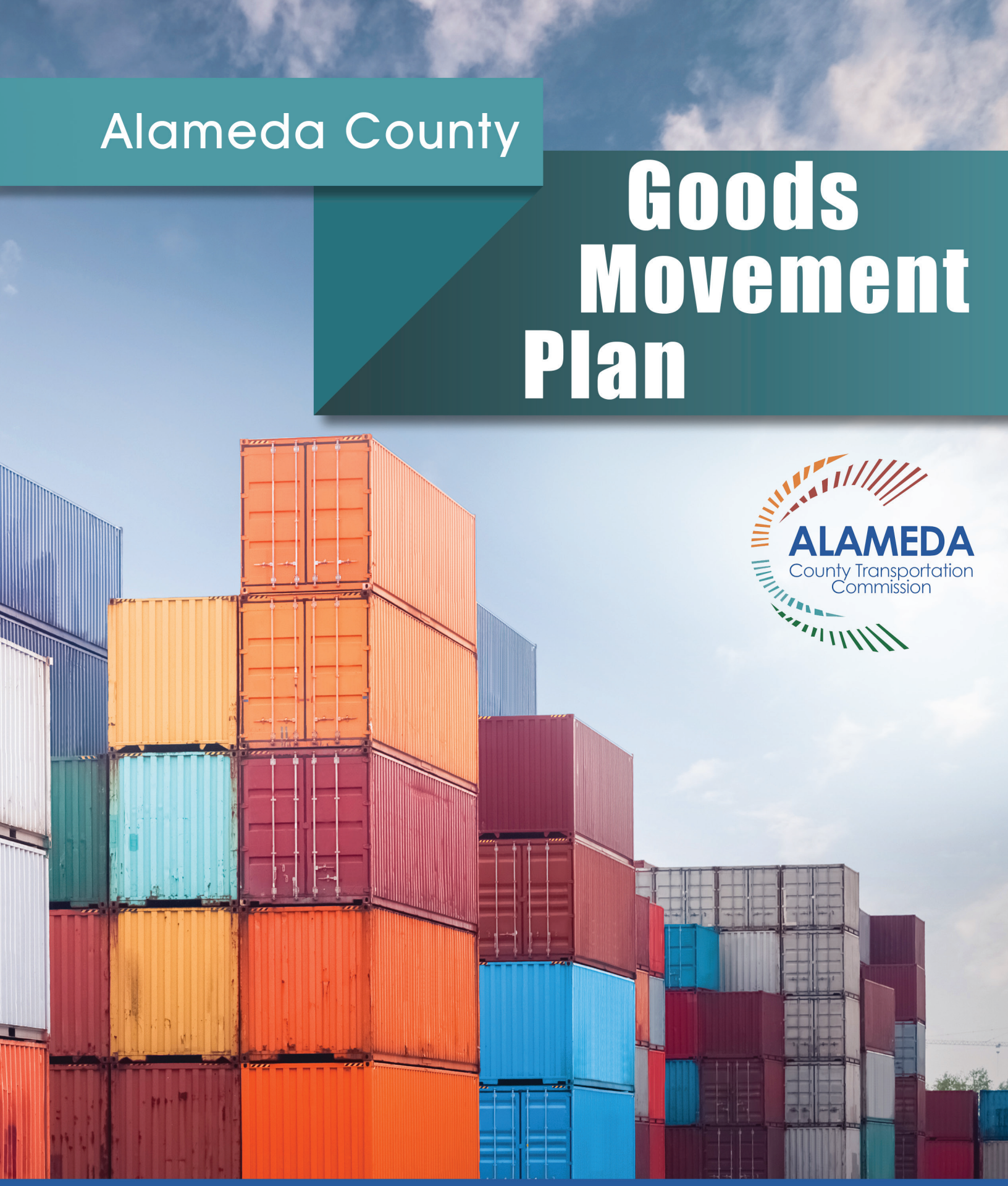
Alameda County

Goods Movement Plan



ALAMEDA
County Transportation Commission

February 2016

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We sincerely thank all of the community interest groups, businesses and individuals for their contribution to this planning effort.

List of Acronyms

3PL	Third-Party Logistics
AAR	Association of American Railroads
AC Transit	Alameda-Contra Costa Transit District
Alameda CTC	Alameda County Transportation Commission
ATA	American Trucking Associations
BAAQMD	Bay Area Air Quality Management District
BCO	Beneficial Cargo Owner
BNSF	Burlington Northern Santa Fe Railway
BRC	Belt Railway of Chicago
BRT	Bus Rapid Transit
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CDOT	Chicago Department of Transportation
CIP	Comprehensive Investment Plan
CMAQ	Congestion Mitigation and Air Quality
CN	Canadian National Railway Company
CO-CAT	Coastal and Ocean Resources Working Group for the Climate Action Team
CP	Canadian Pacific Railway
CREATE	Chicago Regional Environmental and Transportation Efficiency Program
CSX	CSX Railroad
CTC	California Transportation Commission
CTCO	Chicago Transportation Coordination Office
DPM	Diesel Particulate Matter
DOT	Department of Transportation
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EDD	Employment Development Department
FAST	Freight Action Strategy
FAST	Fixing America's Surface Transportation Act (FAST Act)
FRATIS	Freight Advanced Traveler Information Systems
FY	Fiscal Year
GHG	Greenhouse Gas
ICM	Integrated Corridor Management

List of Acronyms

IDOT	Illinois Department of Transportation
IHB	Indiana Harbor Belt
ITIP	Interregional Transportation Improvement Program
ITS	Intelligent Transportation Systems
JSOU	Joint Statement of Understanding
LA Metro	Los Angeles County Metropolitan Transportation Authority
LOS	Level of Service
LSP	Logistics Service Provider
Manifest Traffic	Freight moving in carload service
MAPLA	Maritime and Aviation Project Labor Agreement
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Commission
NS	Norfolk Southern
OIG	Oakland International Gateway
OBAG	One Bay Area Grant
PBA	Plan Bay Area
PCE	Passenger Car Equivalent
PDA	Priority Development Areas
PM	Particulate Matter
R&D	Research and Development
ROI	Return on Investment
RRIF	Railroad Rehabilitation and Improvement Fund
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
STIP	State Transportation Improvement Program
TEU	Twenty-Foot Equivalent Unit
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIGER	Transportation Investment Generating Economic Recovery
TCIF	Trade Corridor Improvement Fund
UP	Union Pacific Railroad
VMT	Vehicle Miles Traveled
WSGIY	Wide-Span Gantry Intermodal Yard



Executive Summary

Executive Summary

Alameda County enjoys one of the most strategic trade locations in the world, and with its connections to national and international markets, the County serves as a natural hub for goods movement throughout the Bay Area and the surrounding Northern California mega region. Alameda County provides most of the critical goods movement infrastructure (including the Port of Oakland, the Oakland International Airport, and various rail and highway infrastructure) that the rest of the region relies upon to bring goods to and from international and national marketplaces.

Goods movement is critical to the County's economy, with about one-third of its employment coming from goods movement-dependent industries; industries such as manufacturing, transportation and warehousing, construction, and retail and wholesale trade. Jobs in the transportation, warehousing, and logistics industries provide critical middle-wage jobs with low educational barriers to entry and career advancement potential. Goods movement in Alameda County includes diverse elements of the supply chain – everything from local trucks delivering groceries to area residents, to electronics components that serve as inputs to the County's and region's manufacturers, to California-produced wine, nuts, and cheeses that utilize the Port of Oakland as an agricultural export gateway.

As seen in Figure ES.1, 32 percent of all goods movement by weight (36 percent by value) in the nine-county Bay Area region has an origin or destination in Alameda County, or uses the County's international gateway infrastructure. An even higher percentage of goods use the County's major highways and rail lines, moving between the rest of the U.S. and the Bay Area, supporting the region's growing consumer and business base. Figures ES.2 and ES.3 illustrate the central location of the Port of Oakland and its associated intermodal rail yard, as well as Oakland International Airport, to the heavily used rail and interstate networks that transport goods to and from points beyond. These critical networks include Union Pacific's (UP) Martinez rail subdivision (the northern route); the UP's Niles and Oakland rail subdivisions (the southern routes); and every interstate highway within the bay region, except I-280, which provide the critical connections between the Bay Area and the rest of Northern California and the rest of the nation.

Alameda County at a Glance:

A major producer and consumer of goods, Alameda County has:

21% of the region's population

25% of the region's manufacturing employment

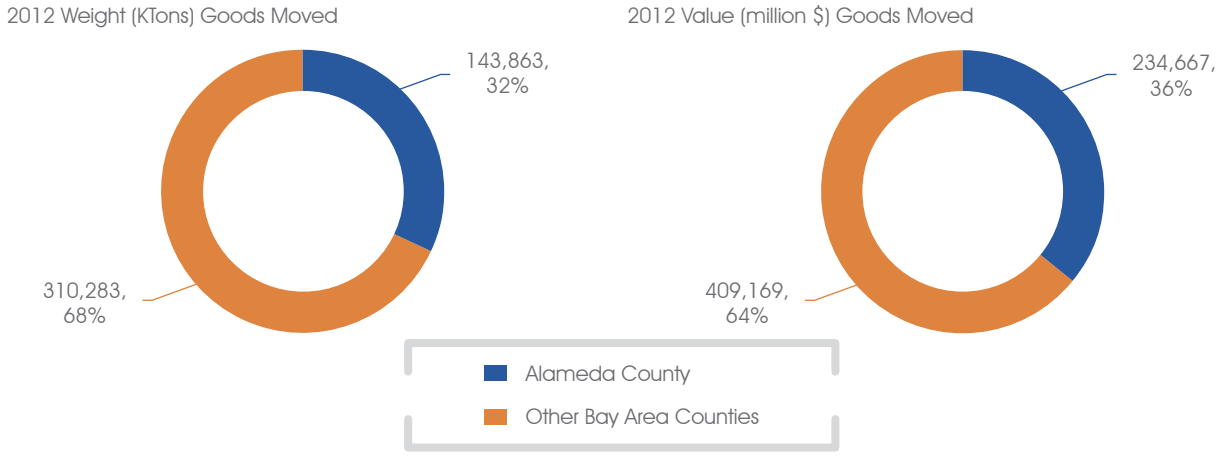
As a provider of transportation services, Alameda County has:

33% of the region's employment in freight transportation and warehousing industries

The County is home to transportation infrastructure vital to the local, regional, and national economy:

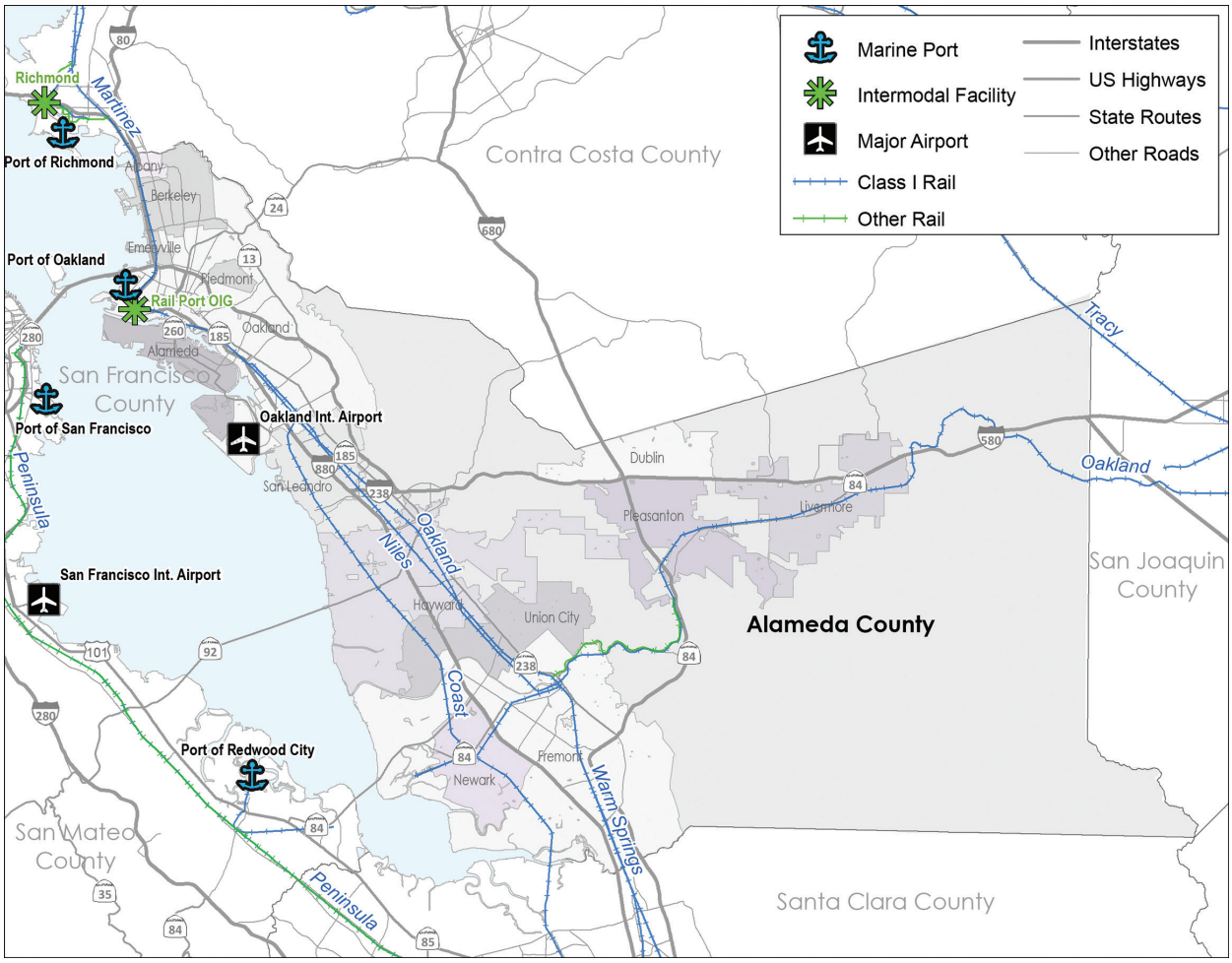
- The Union Pacific's (UP) Railport and BNSF Railway's Oakland International Gateway
- The Port of Oakland and Oakland International Airport
- Major truck routes I-80, I-238, I-580, I-680, I-880, and SR 92

Figure ES.1 Alameda County Goods Movement in Context of Bay Area



Source: Cambridge Systematics, Inc.

Figure ES.2 Alameda County Multimodal System Map



Source: Cambridge Systematics, Inc.

Executive Summary

Figure ES.3 Bay Area Global Gateways and Connecting Corridors



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

Not only is goods movement a significant part of the Alameda County and Bay Area economy, but it is an integral component of everyday life. At the other end of the spectrum from port containers and large-scale freight transport, residents and businesses make daily orders on line to be delivered at their homes and local business sites; shop at small- and medium-sized stores supplied by mid-sized delivery trucks; live in communities affected by freight and related industries; and encounter truck and rail traffic as pedestrians, cyclists, or car drivers. The challenge for goods movement planning is to harness the economic engine of freight and related industries while keeping sight of its purpose for improving every day quality of life and maximizing the economic impact in a sustainable manner for our environment and our communities.

Such a balance can be found, as evidenced by recent air quality improvements achieved through a partnership of the Port, Bay Area Air Quality Management District, and the California Air Resources Board. In 2005, diesel particulate matter (DPM) concentrations in West Oakland were almost three times higher than the average for the San Francisco Bay Area. DPM emissions were reduced 70 percent between 2005 and 2012, despite a 3-percent increase in container volumes. The Port is on track to exceed an 85-percent reduction target of DPM by 2020. Construction of shore power infrastructure, "no idling" signage along port roadways, new cleaner technology-based trucks and locomotives, and use of reduced sulfur fuel contributed to these gains.

This first ever Countywide Goods Movement Plan is designed to take advantage of the economic opportunities provided by goods movement for both the County and all of Northern California while continuing to make progress in achieving quality of life goals.

Future Trends and Growth Challenges

As Alameda County looks to support a growing Northern California goods movement economy, it will take advantage of the potential for expansion and enhancement of its existing infrastructure, encounter exceptionally strong demand, and address bottlenecks and operational inefficiencies to improve its competitive standing:

- **Port of Oakland competitive standing, future growth potential, and operational efficiency.** The Port of Oakland is the fifth largest container port in the U.S. If it can address several critical operational issues and take advantage of the opportunity to provide new services to shippers associated with the redevelopment of the Oakland Army Base, it can improve its efficiency and achieve a higher competitive standing among other ports on the West Coast of North America. 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. These economic benefits to the County will be enhanced through the development of modern logistics facilities at the Oakland Global Logistics Center (the Oakland Army Base redevelopment), which can be used to create new jobs through the provision of value-added logistics services. Bay Area international trade volumes are expected to grow from 66 million tons in 2012 to 159 million tons by 2040. The value of these goods is expected to grow from $156 million to $455 million in the same time frame.

  The sudden surge in bigger post-Panamax ships is creating unintended consequences not only for the portside operations, but also landside operations. A large vessel offloads in one day the same amount that a terminal once typically

handled over the course of two to three days, creating bottlenecks and operational issues that contribute to queues outside the terminal gates, increasing the amount of time it takes trucks to pick up or drop off a load, and decreasing the efficiency in terminal operations. 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 sometimes wait two to four hours. Whereas truckers were previously making three to four turns at the Port per day, they are now making two turns. At-grade railroad crossings in the Port further slow down the turnabout of trucks. At Maritime Street both at-grade crossings (one near 7th Street and the other near Middle Harbor Road) can simultaneously be blocked by one train.

As part of the Oakland Global Logistics Center, some of these issues are to be resolved, primarily through improved and expanded rail service, taking the pressure off of truck operations. This development will include expanded intermodal rail terminal capacity, improvements on the rail mainlines accessing the Port, increased nearby transload warehousing capacity, and expanded cold storage and agricultural product terminals, as well as a variety of truck services nearby the Port.

- **Congestion, reliability, and safety issues on shared-use interregional highway and rail corridors with limited ability to expand highway facilities.** Moving people and goods safely and efficiently is critical for our local economy and communities. Both highway and railroad corridors provide for shared use between passenger and goods movement. Most of the highway corridors in Alameda County experience high levels of peak-period congestion and poor reliability with particularly poor performance on segments of I-80, I-580, I-680, and I-880. 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 and interchange modernization needs in the corridor.

  If traditional rail routing patterns are maintained, there will be insufficient capacity on the UP's Martinez Subdivision from Oakland to Richmond, the busiest rail segment in Northern California (see Table ES.1). This corridor has limited potential for capacity expansion. However, the rail route south of Oakland, through Niles Canyon and the Altamont Pass, could be expanded to meet future demand. Improvements in the southern rail route could help address highway congestion and emissions by diverting cargo from trucks to trains, while at the same time creating more capacity for commuter rail service expansion, which is a key component of this plan.

- **Pressure on local truck routes from changing land use development patterns and connectivity needs, growing modal conflicts, and increased presence of trucks in neighborhoods and commercial areas as a result of growing use of e-commerce.** A substantial amount of goods movement occurs on local streets and roads throughout Alameda County. There are connectivity issues at specific locations, such as connectivity to I-580 from the industrial warehouse area in Pleasanton, access to the Fremont industrial area from Mission Boulevard, lack of connectivity between East County and the other planning areas, need for better connectivity to/from the I-880 West industrial areas, and growing amounts of trucks in neighborhoods and commercial areas as a result of e-commerce.

Table ES.1 Rail Lines 2020 Forecast Level of Service in Alameda County Area

Subdivision	From	To	Number of Main Tracks	Total Daily Trains	Average Capacity	V/C Ratio	LOS
UP Coast	San Jose	Newark	3/1	42	30	140.0%	F
	Newark	Oakland	1	10	18	55.5%	C
UP Martinez	Sacramento	Martinez	3/2	56	75	74.7%	D
	Martinez	Richmond	2	66	75	88.0%	E
	Richmond	Emeryville	3/2	74	75	98.7%	E
	Emeryville	Oakland	2	72	75	96.0%	E
UP Niles	Newark	Niles	2	44	75	58.7%	C
	Niles	Oakland	1	26	30	86.7%	E
UP Oakland	Niles	Stockton	1	23	30	76.7%	D
BNSF Stockton	Stockton	Port Chicago	2/1	22	30	73.3%	D

Source: AECOM calculations.

In recent years, there has been a movement throughout the country to develop Complete Streets[1] plans to accommodate all modal users. However, at this time, most of the Complete Streets guidance and standards provide little information about how to accommodate goods movement; and this is creating modal conflicts between goods movement and transit, bicycles, and pedestrians on a number of the County's arterial routes. The movement towards more transit accessible and compact urban development also has created land use conflicts along existing goods movement corridors in older industrial areas that are undergoing redevelopment. There also is a growing need for truck parking in and around the County's major freight hubs and warehouse centers.

This goods movement plan, in coordination with the Alameda County Transportation Commission (CTC) countywide arterials plan, will address goods movement needs on arterials to support moving goods efficiently as part of the overall transportation network.

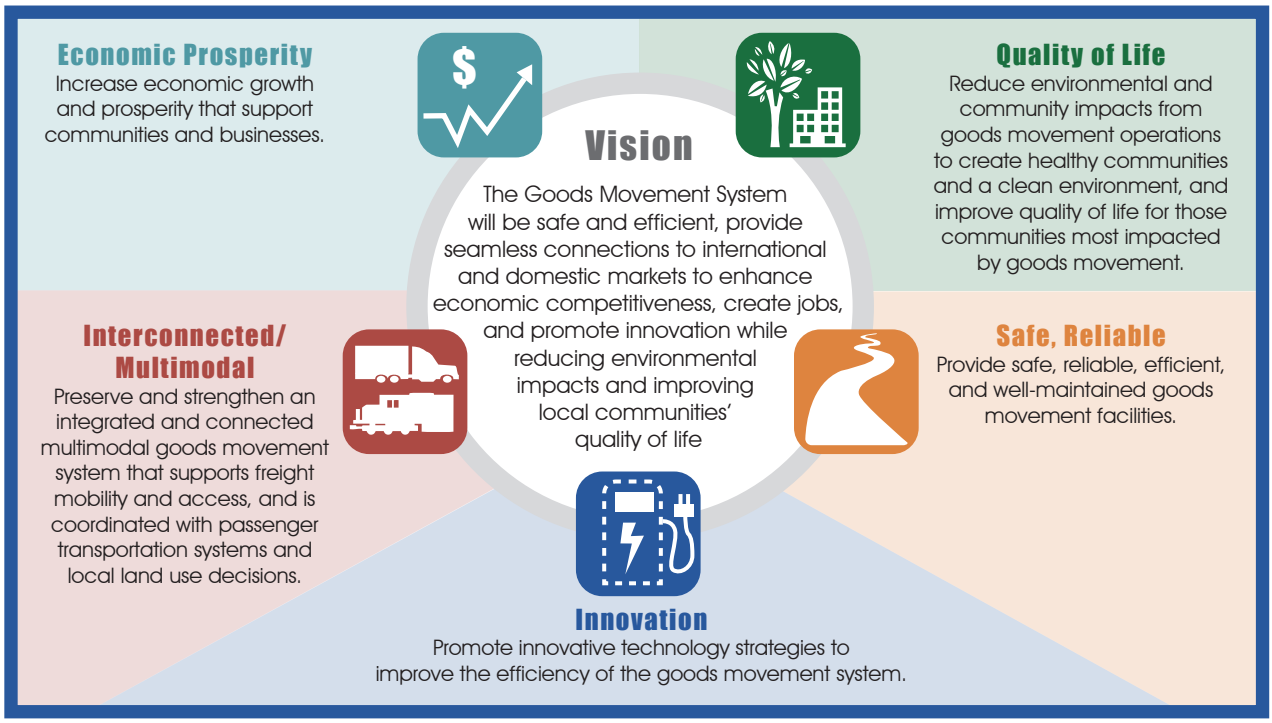
- **Improving air quality and health impacts.** Safe, secure, and community-supportive goods movement projects and programs are essential to the well-being of our local communities. Emissions from goods movement can create significant health risks, and exposure to noise and light also can adversely affect the health and well-being of residents. Particulate matter and nitrogen oxides are the two pollutants most associated with truck, rail, and ship pollution. Fortunately, in recent years, the risks attributable to these two

[1] Complete Streets is a transportation policy and design approach that requires streets to be planned, designed, operated, and maintained to enable safe, convenient, and comfortable travel for all users regardless of their mode of transportation.

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. Due to current regulations, fine particulate matter emissions from on- and off-road motor vehicles are expected to decline significantly until 2020. However, despite tremendous strides in pollution reduction, the West Oakland community, along with several others along the industrial corridors of Alameda County, suffer from 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 that are not goods movement related). Improving conditions for these most affected communities is a core focal point of this plan.

Vision and Goals for the Alameda County Goods Movement System

Alameda CTC sets the following vision and goals for the goods movement system, prioritizing quality of life, safety and reliability, innovation, interconnectedness and multimodal operations, and economic prosperity. By developing creative solutions to address challenges and taking advantage of the opportunities that an efficient goods movement system can provide, the Alameda County Transportation Commission and its partners can frame a new vision of the role of goods movement and can stake out a position of national leadership.



Opportunity Categories

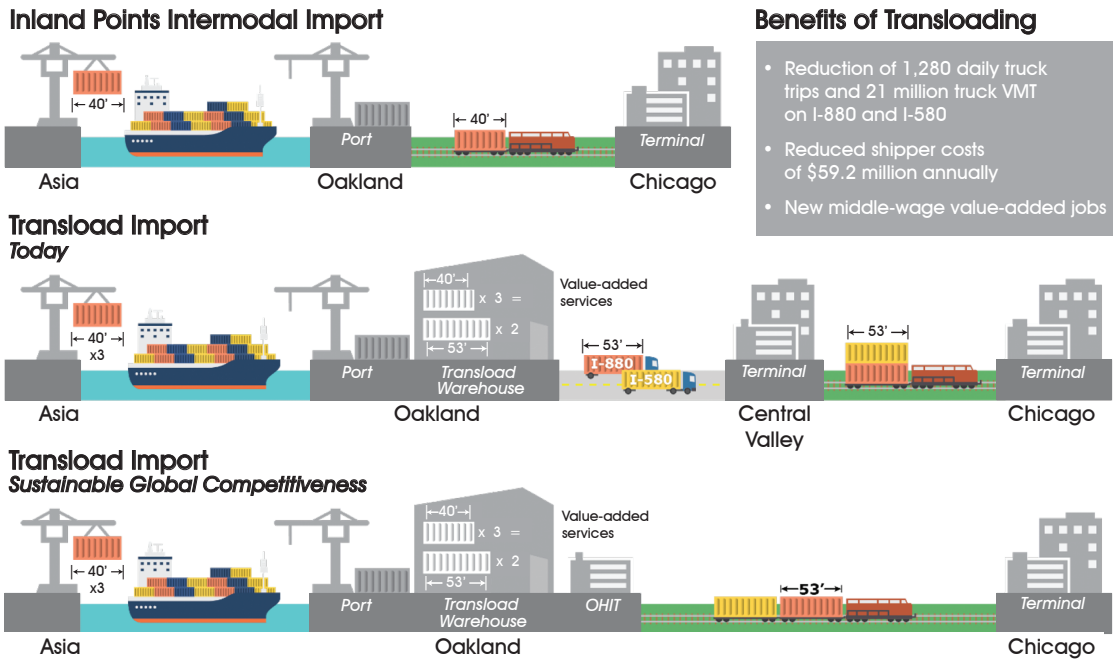
In order to pursue the goods movement vision, Alameda CTC has developed a strategic plan focused on three main opportunity themes, each of which are crucially important to the success of this vision. Strategic projects, programs, and policies are combined into "opportunity categories," where the strategies are linked to produce even greater benefits than could be achieved by individual projects. Technologies, operational strategies, and planning practices are available to ensure that these benefits can be realized while still providing residents – including 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 category will not create negative impacts on communities. The opportunity categories are designed to communicate to the public and key decision makers, both within and outside of Alameda County, what the County's priorities are for goods movement, and how these priorities will promote the County's overall economic, transportation efficiency, and sustainability goals.

Opportunity Category #1: Sustainable Global Competitiveness

This opportunity category 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

Rail investment is critical to creating a world-class logistics hub due to capacity needs on both the northern and southern routes.

Promoting transload intermodal in Oakland shifts truck traffic to rail and creates local jobs.



Executive Summary

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

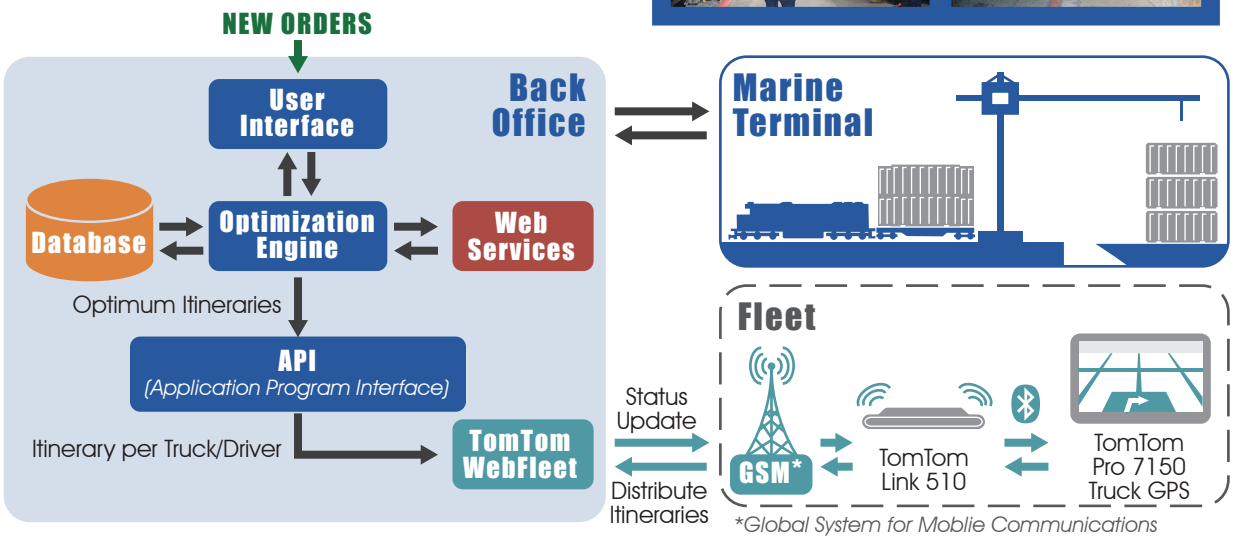
Opportunity Category #2: Smart Deliveries and Operations

Many aspects of the County's surface transportation system are largely built out, with limited opportunities to build new capacity through added lanes or new corridors. Thus, the County has an opportunity to support maximum use of Intelligent Transportation Systems (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

Smart Strategies are Proven Successes

Pilot off-peak delivery program in New York City saw up to 75 percent reduction in travel time for carriers.





Freight Advanced Traveler Information System (FRATIS) Demonstration at the Port of Los Angeles showed 34.7 percent reduction in daily miles traveled, and 15.3 percent reduction in time it takes per order.

manage local traffic and reduce conflicts. Elements of this opportunity category 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 category. This category also includes more efficient use of the existing system through innovative logistics practices, including incentives to building owners to encourage off-peak deliveries and extended gate hours at the region's ports.

Opportunity Category #3: 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 an opportunity for improvement at the heart of the goods movement plan. Strategies 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. Continued growth of e-commerce changes the landscape of retail and last-mile delivery needs, and the importance of pavement conditions and roadway alignments that support goods movement throughout cities; not just on the highways and the designated truck corridor arterials. Many busy retail districts are being redesigned according to Complete Streets guidelines, and there is an opportunity to contribute to this redesign process so that heavy trucks supplying stores and lighter delivery trucks fulfilling e-commerce orders to residences are both accommodated, while rights-of-way no longer necessary can be returned to other uses

Moving Forward

Moving forward with the three opportunity categories will require multi-jurisdictional partnerships with participation by various levels of government and the private sector, as seen in Figure ES.4. This includes both transportation and non-transportation agencies, as well as businesses and community organizations. The categories require coordination of a wide range of funding sources. Projects to be completed at different times will still need to be coordinated so that the synergies reflected in the categories are fully realized. To do this, the plan recommends:

Figure ES.4 Moving Forward with the Plan



Executive Summary

- **Developing a formal institutional framework for coordinating implementation.** A formal institutional framework should define the roles and responsibilities of all implementing agencies, specify project priorities and likely timing, identify potential funding sources and responsibility for making applications for funding, and commitment from the participants to implement those elements of the category that are within their jurisdiction. The framework should define how the parties inform each other and coordinate their project delivery functions. A Memorandum of Understanding among the partners could spell out the specific responsibilities for project delivery and target funding contributions.

- **Creating 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.

- **Creating a technology development collaborative.** The zero and near-zero emission collaborative and the technology advancement program and the strategies to introduce advanced logistics technologies could involve a public-private collaborative that would ensure that the region's technology innovation sector helps to define application opportunities and is involved in delivering technology in response to public-sector demonstrations and procurements. The collaborative could work to establish performance standards, coordinate policies/investments in infrastructure, and seek funding for demonstrations.

The costs of implementing the goods movement plan are substantial, and there currently are only a few dedicated sources of funding for goods movement projects in the region, including some funding in Measure BB, a local voter-approved sales tax measure. Nonetheless, there are promising opportunities on the horizon that could be tapped to begin the implementation process. In order to develop a funding package for the plan, Alameda CTC, the Metropolitan Transportation Commission (MTC) and regional partners should:

- Effectively leverage the available funds from Measure BB through partnerships with other agencies in the County and by pursuing all appropriate regional, state, and federal funding opportunities;
- Aggressively pursue the existing programs within the State's Cap and Trade framework to support zero and near-zero emission technology implementation and advocate for the designation of a goods movement-focused program with the portion of the Cap and Trade funding that has not been allocated;
- Continue to advocate for the state legislature to provide regular funding for the Trade Corridor Improvement Fund; and
- Continue to work with national coalitions to support multimodal projects within new federal freight funding programs.

This Alameda County Goods Movement Plan outlines a long-range strategy for how to move goods effectively within, to, from, and through Alameda County by roads, rail, air, and water. It provides specific strategies – projects, programs, and policies – focused on goods movement that will ultimately feed into the Alameda Countywide Transportation Plan. By taking this first step, Alameda CTC has initiated a process that can realize greater benefits from goods movement in the County and ensure its continued leadership as a major goods movement center in Northern California and the nation.



Chapter 1

Introduction

1 Introduction

1.1 Background and Context

Alameda County enjoys one of the most strategic trade locations in the world, and with its connections to national and international markets, the County serves as a natural hub for goods movement throughout the Bay Area and the surrounding Northern California mega region. Alameda County provides most of the critical goods movement infrastructure (including the Port of Oakland, the Oakland International Airport, and various rail and highway infrastructure) that the rest of the region relies upon to bring goods to and from international and national marketplaces.

Goods movement is critical to the County's economy, with about one-third of its employment coming from goods movement-dependent industries; industries such as manufacturing, transportation and warehousing, construction, and retail and wholesale trade. Jobs in the transportation, warehousing, and logistics industries provide critical middle wage jobs with low educational barriers to entry and career advancement potential. Goods movement in Alameda County includes diverse elements of the supply chain – everything from local trucks delivering groceries to area residents, to electronics components that serve as inputs to the County's and region's manufacturers, to California-produced wine, nuts, and cheeses that utilize the Port of Oakland as an agricultural export gateway.

Alameda County faces many challenges as it looks to support a growing Northern California goods movement economy. Competition from other West Coast ports across North America and direct shipping lines to the Eastern United States with the coming Panama Canal expansion threaten to erode Port of Oakland business. Trucks and freight railroads compete with passenger transportation on increasingly congested roads and rail lines. Major freight facilities can affect public health and local communities. Innovative and creative strategies are needed to ensure that the County can continue to reap economic benefits from its goods movement system while enhancing the quality of life of its residents. This first ever Countywide Goods Movement Plan provides a roadmap for achieving this goal.

Alameda County at a Glance:

A major producer and consumer of goods, Alameda County has:

21% of the region's population

25% of the region's manufacturing employment

As a provider of transportation services, Alameda County has:

33% of the region's employment in freight transportation and warehousing industries

The County is home to transportation infrastructure vital to the local, regional, and national economy:

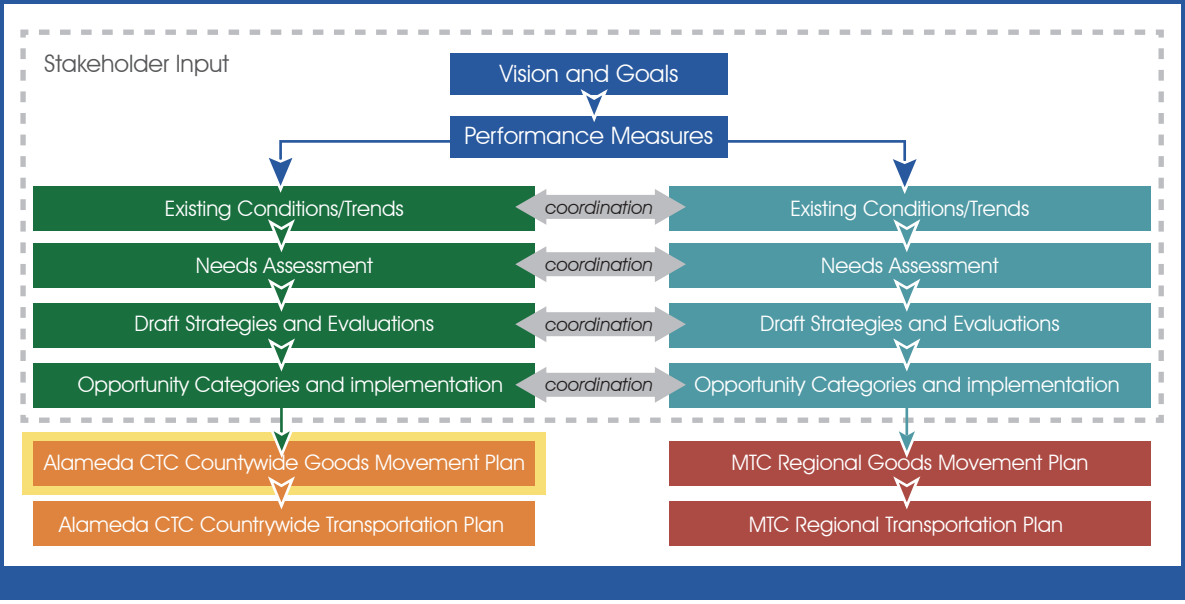
- The Union Pacific's (UP) Railport and BNSF Railway's Oakland International Gateway
- The Port of Oakland and Oakland International Airport
- Major truck routes I-80, I-238, I-580, I-680, I-880, and SR 92

1.2 Plan Development Approach and Purpose

Because of its central locality and goods movement infrastructure in the Bay Area and Northern California, the Alameda County Transportation Commission (Alameda CTC) has led the effort to develop a Countywide Goods Movement Plan. This Alameda County Goods Movement Plan (Plan) outlines a long-range strategy for how to move goods effectively within, to, from and through Alameda County by roads, rail, air and water. It provides specific strategies – projects, programs, and policies – focused on goods movement that will ultimately feed into the Alameda Countywide Transportation Plan. The Goods Movement Plan:

- Establishes a vision for a sustainable goods movement system that supports the economy and local communities.
- Identifies strategies including infrastructure investments, policy changes and programs to address goods movement issues and realize goods movement opportunities.
- Uses a series of performance measures consistent with the vision and goals to prioritize these strategies.
- Focuses the strategies on key opportunities for Alameda County that take advantage of its unique characteristics.
- Develops short- and long-term recommendations for how to work with other partners in the Bay Area to advance the Plan and to advocate for the policies and funding needed from local, regional, state and federal partners.

Because goods movement markets and supply chains frequently cross county lines, Alameda CTC has partnered with the Metropolitan Transportation Commission (MTC) to jointly develop the Countywide Goods Movement Plan and the Regional Goods Movement Plan. The joint long-range plan development process ensured consistency between plans and created synergies that can be leveraged through cooperative funding, joint advocacy, and partnerships. The graphic shows the key elements of the two plans, their relationships, and how they feed into the Countywide and Regional Goods Movement Plans.



1 Introduction

In order to actively engage stakeholders in the development of the Plan and to provide an on-going platform for communication and advocacy on behalf of the plan, Alameda CTC and MTC formed a Bay Area Goods Movement Collaborative. This Bay Area Goods Movement Collaborative brings together partners, community members, and other stakeholders from across the region, to understand goods movement needs and identify, prioritize, and advocate for short- and long-term strategies to address these needs. The Collaborative creates an organized structure to bring goods movement interests to the table and to ensure effective advocacy for goods movement needs in Alameda County and the Bay Area region at-large. The groups that formed the Collaborative are described in the sidebar.

Each of these groups played an active role in helping to shape this Plan. The Executive Team met a number of times to review critical inputs to the Plan; to provide perspectives on how the Plan's priorities could better reflect their respective agency priorities; and to provide high-level guidance for how best to present the Plan to County and regional decision makers. The Technical Team reviewed all of the technical documents that formed the basis of the plan and provided important critiques of the analyses. Interest Groups were consulted through three rounds of direct outreach during the planning process – at the beginning to identify key issues that needed to be addressed, in the middle to provide feedback on the needs identified and potential solutions, and at the completion of the evaluation of strategies to provide input on the emerging project and program priorities. There were five roundtables held for the plan that were well attended by public and private sector representatives and representatives of community, environmental, and public health organizations. The roundtables provided opportunities for all interested stakeholders to discuss and provide input on key issues, impacts of goods movement on communities, goods movement needs, goods movement strategies, and future advocacy.

The **Executive Team** included executive-level staff from Alameda CTC, MTC, Port of Oakland, California Department of Transportation (Caltrans), East Bay Economic Development Alliance, Bay Area Air Quality Management District (BAAQMD), and regional Congestion Management Agency Executive Directors from Solano, Contra Costa, and Santa Clara Counties.

The **Technical Teams** included staff from the agencies represented on the Executive Team, as well as other stakeholders from cities, counties, regional agencies, and transit and transportation partners, in addition to stakeholders representing public health, community, and business interests related to the goods movement system.

Interest Groups included private-sector goods movement organizations (shippers, carriers and logistics service providers), businesses, environmental and public health organizations, community and social justice groups, labor and other key stakeholders from across the Bay Area region who provided frequent, structured input on goods movement issues.

The **Goods Movement Roundtables** provided a regular forum and information exchange platform for all stakeholders to foster dialogue from all groups and a platform for advocacy.



Chapter 2

A Vision for the Future

2 A Vision for the Future

A fundamental part of developing the Alameda Countywide Goods Movement Plan was the development of a vision and goals that respond to the challenges that the County faces as it seeks to realize the benefits that an efficient and sustainable goods movement system can provide. The vision lays out strategic direction for the County, and both the vision and goals were developed to align with higher-level goals developed for Alameda CTC's Countywide Transportation Plan and MTC's Regional Transportation Plan, but also reflect the need to address critical issues and opportunities focused specifically on the goods movement system as identified by stakeholders and analysis conducted for this plan.

Each of the goods movement goals is presented with a summary of the challenges that must be addressed in order to meet the goals.



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, as well as strategies to protect the environment and infrastructure by reducing greenhouse gases (GHG).

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 also 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. Such cases 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), the BAAQMD and the California Air Resources Board (CARB) are actively seeking to reduce emissions from

key sources.[2] PM pollution, especially $PM_{2.5}$ pollution, is of utmost concern from a freight perspective. From July 2009 to December 2011, during the peak $PM_{2.5}$ concentration period, freight transportation contributed to 17 percent of total $PM_{2.5}$ pollution in the Bay Area (13 percent from diesel vehicles, 2 percent from ships, and 2 percent from aircraft/trains). Given that Alameda County houses a significant portion of these freight activities, it likely contributes an equally significant share of $PM_{2.5}$ pollution. Even with regional attainment, more localized challenges related to controlling PM may remain.

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.[3] In addition, MTC is conducting an assessment of regional opportunities to apply zero and near-zero emission technologies for goods movement. Alameda County goods movement planning will benefit significantly from this state and regional work.

2.1.2 Safe and Reliable

GOAL

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

The interregional and intraregional highway corridors in Alameda County carry the highest volumes of truck traffic. The high volumes of traffic, 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 components also are 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 also will create safety and community impact challenges that will require improvements to at-grade crossings or new rail quiet zones.

Ports and airports also are crucial pieces of the goods movement system in Alameda County and beyond and experience reliability and efficiency issues of their own. The Port of Oakland will continue to play a large role in Alameda County's goods movement future. Slow turn times at the Port due to truck queueing, uncoordinated drayage trucker arrivals, and blockage of truck access routes by rail lines through the Port pose significant reliability issues that impact the competiveness of the Port to shippers. Similarly, Oakland International Airport is affected by reliability issues from congestion on last-mile access roads, which is of heightened importance given the time-sensitivity of the high-value shipments destined for this global gateway. The threat of storm surges from sea-level rise also is a major potential reliability and maintenance issue for Oakland International Airport.

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

[3] 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 intelligent transportation systems (ITS) and connected/autonomous vehicles for improving the efficiency of freight operations, a number of which currently are being tested or applied around the nation and could be considered in Alameda County. Other technologies, such as zero and near-zero emission trucks, also hold promise for addressing goods movement environmental challenges. Beyond technologies, innovative operational practices such as strategies that incentivize truck travel to occur in off-peak times can increase goods movement and overall transportation system efficiency.

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. One aspect of today's economy that is changing the nature of goods movement demand is the rise of e-commerce, which relies on a well-connected and accessible goods movement system. This shift may lead to several results, from an exacerbation of "last-mile" delivery issues like inadequate delivery van parking space in concentrated urban centers to a 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.

Alameda County has 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[4]

[4] Priority Development Areas (PDA) are areas that communities identified as possible areas to grow, nominated by the city or town council via resolution. They are generally areas of at least 100 acres where there is local commitment to developing more housing along with amenities and services to meet the day-to-day needs of residents in a pedestrian-friendly environment served by transit.

and many of the Growth Opportunity Areas nominated by Alameda County jurisdictions to take on additional housing and employment overlap with industrial areas. However, 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. All Alameda County jurisdictions have adopted Complete Streets policies and are now moving into implementation phases. 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.

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.

The emphasis on more compact streets that may impede maneuverability of trucks has resulted in concern from some motor 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.

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. While some traditional manufacturing activities have moved to the San Joaquin Valley, primarily due to availability of cheaper land, lower labor costs, and better access to the Interstate highway system, other traditional manufacturing industries are still located in the Bay Area and, thus, require continued support from the goods movement 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 those jobs in traditional manufacturing.

While some of these trends have moderated, on the whole, they are likely to continue into the future as the region continues to shift away from major

manufacturing towards software development and information services, and 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.

Clean energy technology is another area of growth in Alameda County, as well as in the greater region. Tesla, headquartered in Palo Alto and with a major manufacturing facility in Fremont, is an international leader in electric personal vehicles. 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.

Finally, a major opportunity for economic prosperity in Alameda County and the Bay Area is from the redevelopment of the Oakland Army Base. This redevelopment, called the Oakland Global Logistics Center, will increase rail terminal capacity, improve and increase warehousing facilities, including modern transloading buildings, and improve rail access to improve the attractiveness of the Port of Oakland relative to other West Coast gateways and create more than 2,600 middle-wage jobs.[5]

[5] Oakland Army Base 2012 EIR Addendum.

2.2 Goods Movement Opportunities

In order to pursue the goods movement vision and address challenges, Alameda County has developed a plan focused on three interrelated opportunity categories that address the different goods movement infrastructure needs and support the adopted vision and goals. These three opportunity categories focus on solutions rather than problems by combining infrastructure, policy, and program strategies that can produce greater benefits than individual projects could achieve on their own. It is important to note that, with proper investments and policies, Alameda County 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 the residents of the County – even those who live near major goods movement infrastructure – with a high quality of life and economic opportunity. Each of the opportunity categories addresses all goals and includes sustainability components to ensure support of local communities.

2.2.1 Sustainable Global Competitiveness

This opportunity category builds on the unique combination of assets around the Port of Oakland, Oakland International Airport, and the redevelopment of the Oakland Army Base (Oakland Global Logistics Center) 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 that increase Port competitiveness with the

potential to remove over a thousand trucks per day on the most congested freight highway corridors that would otherwise result from the full build-out of the Oakland Global Logistics Center. Technology and operational strategies also are included to reduce impacts of goods movement activity on the health, safety, and quality of life in neighboring communities.

2.2.2 Smart Deliveries and Operations

Alameda County's transportation system is predominately built out with limited opportunities to build new capacity. Thus, the County has an opportunity to support the 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 category will take advantage of the innovation economy and technology sectors in the County and the Bay Area, making them an integral provider of the systems that will be needed to advance the strategies included in this category.

2.2.3 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 focuses 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.





Chapter 3

Goods Movement and the Economy

3 Goods Movement and the Economy

Alameda County is one of the most important economic drivers in the Bay Area, with employment of more than 694,450 workers in 2010, which accounts for 21 percent of the nine-county Bay Area's jobs.[6] A variety of industries contributes to this employment, including both goods movement and non-goods movement-dependent industries. Goods movement-dependent industries are those 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. The data on employment, output, and freight flows in this section generally indicate that goods movement is an integral part of the County's economy and that goods movement activity is growing and becoming increasingly international, valuable, and multimodal.

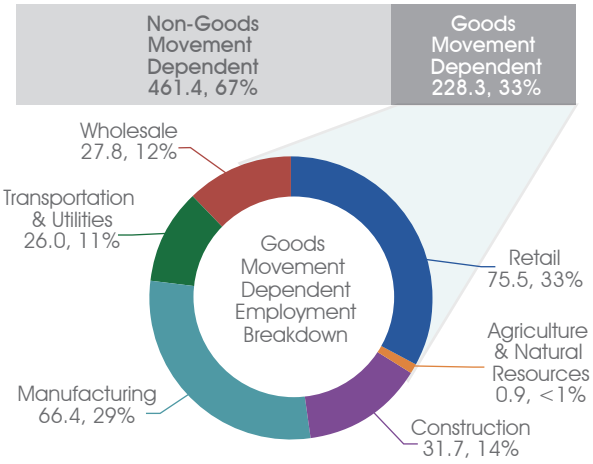
Goods movement-dependent industries are those for whom moving goods to markets is a critical aspect of their business operations. These goods movement-dependent industries include manufacturing, retail trade, wholesale trade, construction, transportation/warehousing, and agriculture.

3.1 Employment and Output

Figure 3.1 shows employment in goods movement-dependent industries in Alameda County in 2010. The figure illustrates the importance of goods movement-dependent industries in the County, which represented one-third of all jobs in 2010. The figure also shows a highly diverse industry makeup with vibrant retail, manufacturing, wholesale, construction, and transportation/utility sectors.

Of note, Alameda County has a very diverse manufacturing sector, including both high-technology products and more traditional manufacturing (such as food processing, metal products, and machinery). Table 3.1 illustrates the share of employment and industrial output in manufacturing contributed by each manufacturing subsector for Alameda County and the Bay Area. Industrial output is the value of what is produced by factories and mines in the county and is measured as a share of gross domestic product (GDP). If the computer manufacturing sector, which in the Bay Area is predominantly focused on engineering and design as opposed to actual production (which has largely moved offshore), is excluded, Alameda County represents 25 percent[7] of regional employment in manufacturing.

Figure 3.1 Employment in Goods Movement-Dependent Industries in Alameda County, *2010, Thousands of Employees*



Source: ABAG Plan Bay Area Economic Forecasts; factors from CCSCE; and Cambridge Systematics Analysis.

[6] Plan Bay Area.

[7] IMPLAN, 2011.

Table 3.1 Manufacturing-Sector Employment and Output Shares in Alameda County and the Bay Area, *2011*

	Alameda County		Bay Area	
	Employment	Output	Employment	Output
Chemical Products	6.8%	12.5%	6.8%	6.6%
Computer and Related Equipment Products	12.8%	27.8%	29.6%	47.2%
Electronic Instrument Products	13.9%	9.1%	13.8%	5.1%
Food, Beverage, and Tobacco Products	15.2%	12.3%	13.0%	5.4%
Furniture and Related Products	2.2%	0.7%	1.4%	0.2%
Machinery	8.1%	6.7%	5.4%	2.2%
Medical Equipment and Supplies	7.0%	4.1%	4.5%	1.3%
Metal Products	11.3%	4.9%	8.0%	2.1%
Motor Vehicle Products	2.4%	4.3%	3.8%	2.3%
Other Miscellaneous Manufactured Products	2.6%	1.2%	1.5%	0.3%
Petroleum and Coal Products	0.6%	9.1%	2.5%	25.4%
Plastics and Rubber products	6.5%	3.5%	3.1%	0.8%
Textile Products	2.5%	0.6%	1.8%	0.2%
Wood and Paper Products	8.1%	3.1%	4.8%	0.9%
Total	100.00%	100.00%	100.00%	100.00%

Source: IMPLAN: Economic Impact Analysis 2011 and Cambridge Systematics analysis.

Goods movement jobs can contribute to job diversity, which has been identified as a regional challenge.[8] There are many jobs in the transportation, warehousing, and logistics industries that do not require high levels of education and are often discussed as 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. In Oakland-Fremont-Hayward, goods movement jobs represent 16 percent of jobs with low educational requirements. Data show that the average hourly wages for some of these goods movement occupations pay near to or above the median hourly wages for all occupations.[9] Additionally, the Moving to Work in the Bay Area initiative[10] has identified "industries of opportunity," which are those 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 in Alameda County that can help provide this necessary job diversity.

8 Bay Area Prosperity Plan, www.onebayarea.org/regional-initiatives/Bay-Area-Prosperity-Plan.html.

9 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).

10 Moving to Work in the Bay Area, www.moving2work.org/brief3.html.

3 Goods Movement and the Economy

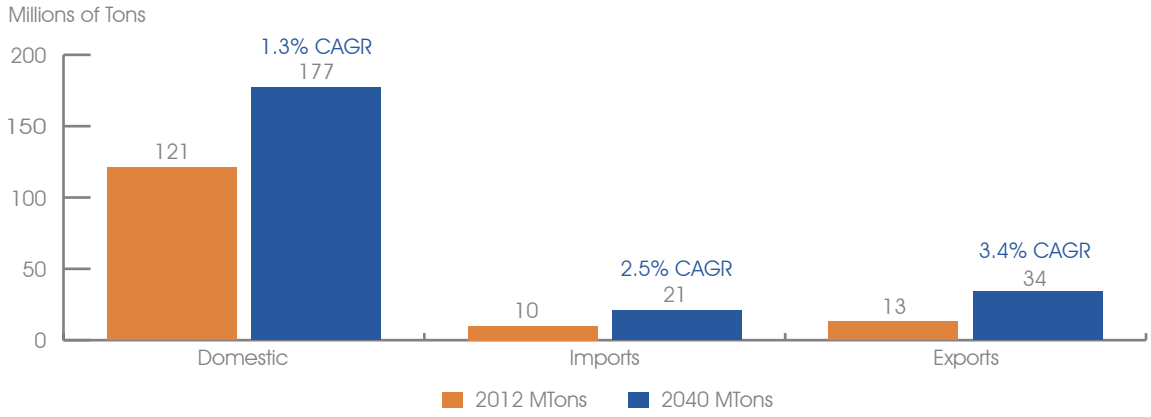
3.2 Goods Movement Flows

As seen in Figure 3.2, in 2012, domestic movement made up about 84 percent of all tonnage moved in Alameda County. These freight movements indicate the continuing importance of interregional connections between Alameda County and the goods producers and distributors in the rest of the country, as well as the continuing importance of domestic markets for Alameda County producers. While domestic freight flows will continue to dominate Alameda County goods movement, Figure 3.2 shows that international trade is the fastest growing element of Alameda County's goods movement flows and that exports are growing at a faster rate than are imports. By 2040, international trade goods are expected to comprise 24 percent of the County's goods movement by tonnage and almost 33 percent by value. The role that the Port of Oakland plays in facilitating this export growth is a critical role that Alameda County plays in the state and national freight network. It also is interesting to note that the rate of growth of trade in value is greater than it is for tonnage, indicating a continuing shift of the County's trade to higher value products.

While **domestic freight flows will continue** to dominate Alameda County goods movement, **international trade** is the **fastest growing** element of Alameda County's goods movement flows and exports are growing at a faster rate than are imports.

As Figure 3.3 shows, trucking is and will continue to be the predominant mode for goods movement in Alameda County, accounting for 81 percent of tonnage moved and 60 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 (container) rail. When both are considered together, rail is the second most important mode in terms of tonnage, accounting for approximately 8.0 percent of tonnage moved. This is expected to increase to 14.6

Figure 3.2 Alameda County Freight-Flow Volumes by Trade Type, *2012 and 2040, Millions of Tons*



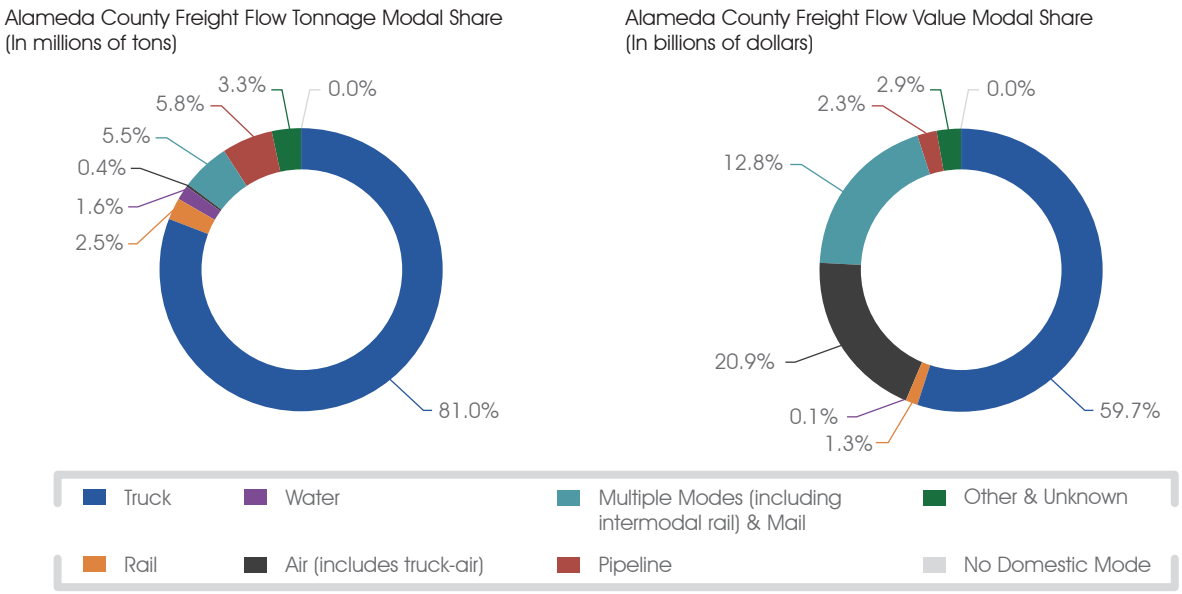
Source: FAF3.

Note: CAGR = Compound Annual Growth Rate.

percent by 2040. In 2012, air cargo, with its emphasis on high-value product was the second most important mode measured by value moved, accounting for 20.9 percent of value moved. However, the anticipated slowing in the rate of growth in domestic air cargo overall (which predominates at Oakland International Airport) and the increased reliance on intermodal rail at the Port of Oakland is expected to increase the relative importance of rail, which is expected to account for approximately 24 percent of the value of products moved in the County by 2040. Clearly, investments will be required to support all of the modes of transportation that move goods in the County to meet future demands.

As shown in Figure 3.4, a wide range of commodities is moved in and out of Alameda County. This reflects the diverse roles of goods movement in the Alameda County economy, including the products of the County's industries, consumer goods, inputs to the region's construction sector, and imports and exports moving through the County's international gateways. 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 (nonmetallic mineral products, gravel, and natural sands); fuels and refinery inputs; and agricultural products, many of which are exported through the Port of Oakland. The products that represent the highest shares of goods movement in terms of value include electronic components; the products of the County's technology and biotech sector; and consumer products (including food, clothing, and automobiles).

Figure 3.3 Alameda County Freight Flows Modal Share by Tonnage and Value

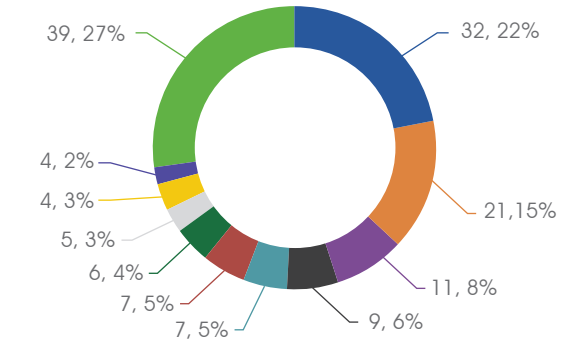


Source: Freight Analysis Framework (FAF) 3 Database, 2009 Federal Highway Administration (FHWA) FAF2 Disaggregation Study, USA Trade Online data, U.S. Army Corps of Engineers' Waterborne Commerce data, 2013 Oakland Army Base Development Environmental Impact Report (EIR), 2013 California Air Groundside Needs Study, 2013 California State Rail Plan, Cambridge Systematics, Inc.

3 Goods Movement and the Economy

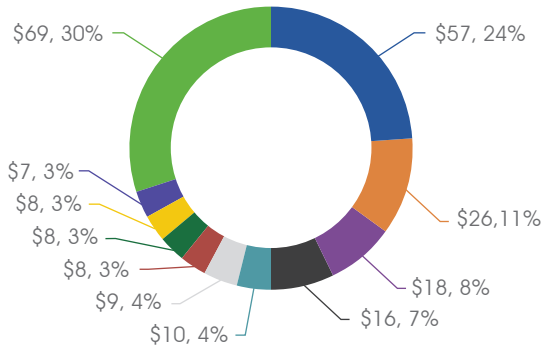
Figure 3.4 Alameda County Top Commodity Flows by Annual Tonnage and Value

Alameda County Freight Flows
(In millions of tons)



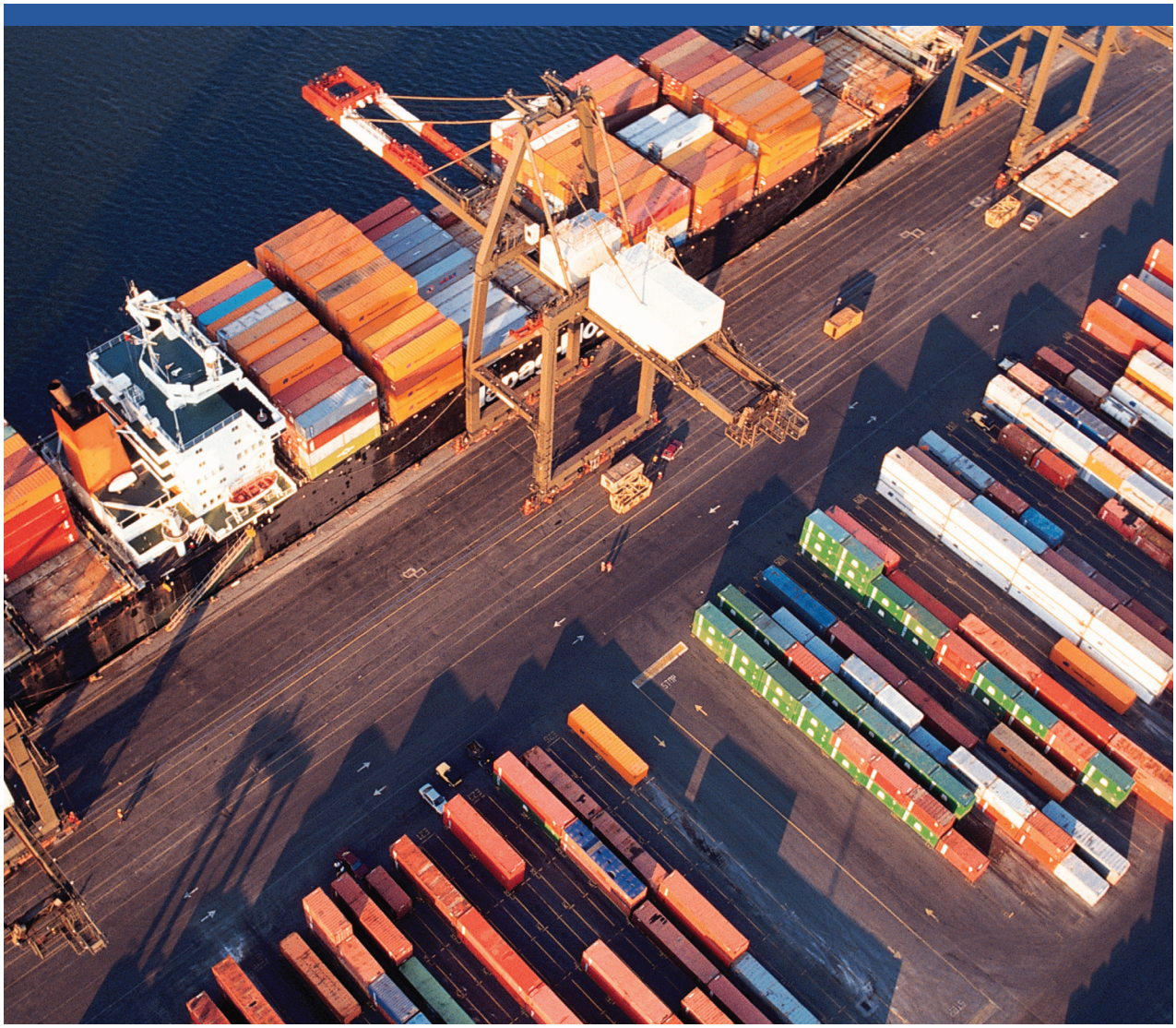
Waste/Scrap
Nonmetal Mineral Products
Gravel
Coal & Petroleum Products
Gasoline
Other Foodstuffs
Other Agriculture Products
Natural Sands
Cereal Grains
Nonmetallic Minerals
Other

Alameda County Freight Flows
(In billions of dollars)



Electronics
Machinery
Motorized Vehicles
Precision Instruments
Textiles/Leather
Mixed Freight
Other Foodstuffs
Other Agriculture Products
Pharmaceuticals
Miscellaneous Manufacturing Products
Other

Source: FAF3 Database, 2009 FHWA FAF2 Disaggregation study, Cambridge Systematics, Inc.



Chapter 4

Goods Movement Systems

4 Goods Movement Systems

Alameda County's 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. This section discusses Alameda County's goods movement system in terms of its three functions, as illustrated in Figure 4.1. It also highlights how the Alameda County goods movement system is crucially important to the Bay Area region and the greater northern California megaregion.

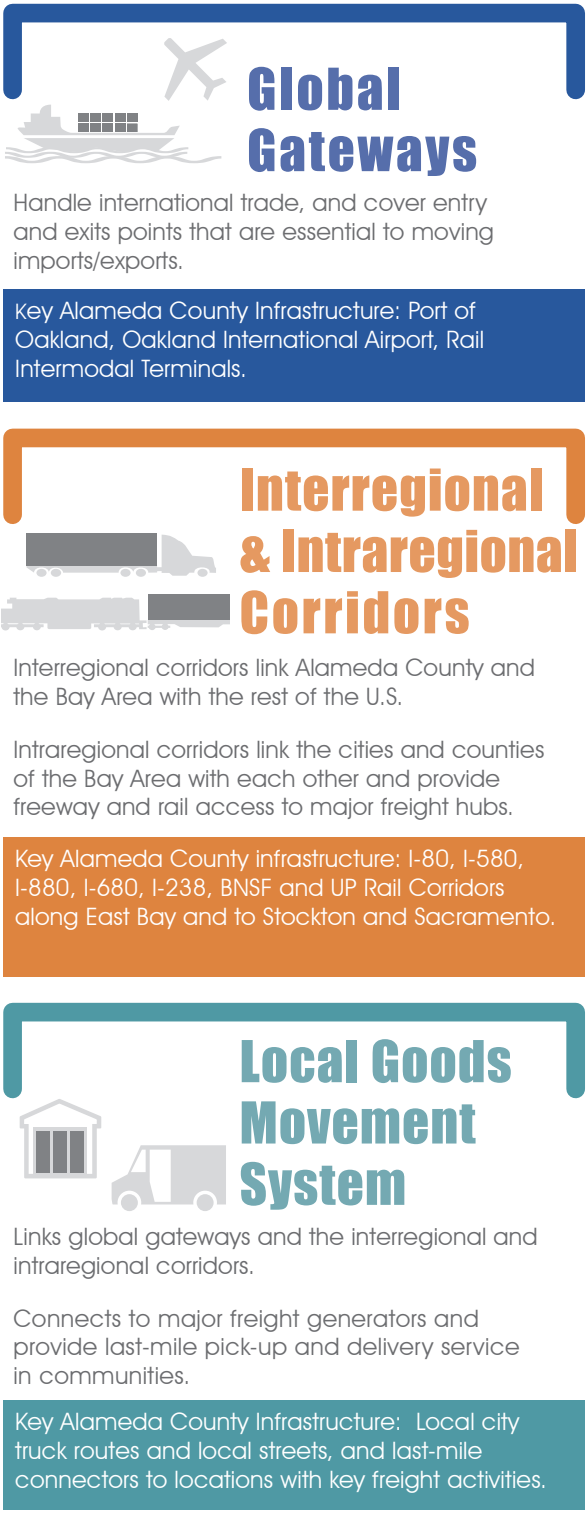
4.1 Global Gateways

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 that make up Alameda County's freight transportation system include the major maritime facilities at the Port of Oakland and Oakland International Airport, which handles international, as well as domestic air cargo. Figure 4.2 shows the global gateway facilities in relation to the multimodal freight system. Figure 4.3 zooms out to the Bay Area to show how Alameda County's global gateways and connecting corridors are centrally located to service the entire region, as well as points beyond in the Sacramento and Central Valley regions.

The Port of Oakland in Alameda County is the largest container port in Northern California and is the fifth busiest container port in the U.S.[11] The Port currently

[11] Port of Oakland, Maritime Comprehensive Truck Management Program, adopted on June 16, 2009.

Figure 4.1 Goods Movement System Functions

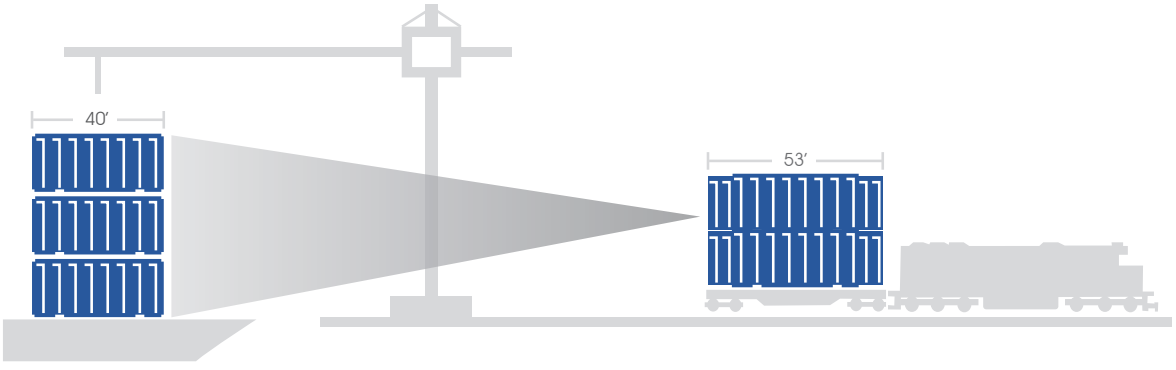


has 8 container terminals, 18 deepwater berths, and 36 container cranes; 30 of which are Post-Panamax size.[12] The Port is primarily served by I-880 and I-80; two Class I railroads; and 10 miles of short line track operated by Oakland Gateway Railroad Enterprise warehouses, and two nearby intermodal terminals (UP's Railport and BNSF's Oakland International Gateway). 7th Street, Maritime Street, and Middle Harbor Road provide "last-mile" access to the seaport.

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 due to population 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 will continue to be a gateway for products ultimately destined for Northern California and parts of Nevada and the Midwest. Finally, the growth of transloading nearby to the Port also creates an economic opportunity for Alameda County.

[12] http://www.portofoakland.com/maritime/operations.aspx (last accessed on February 13, 2014).

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 transportation**, 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 on 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.



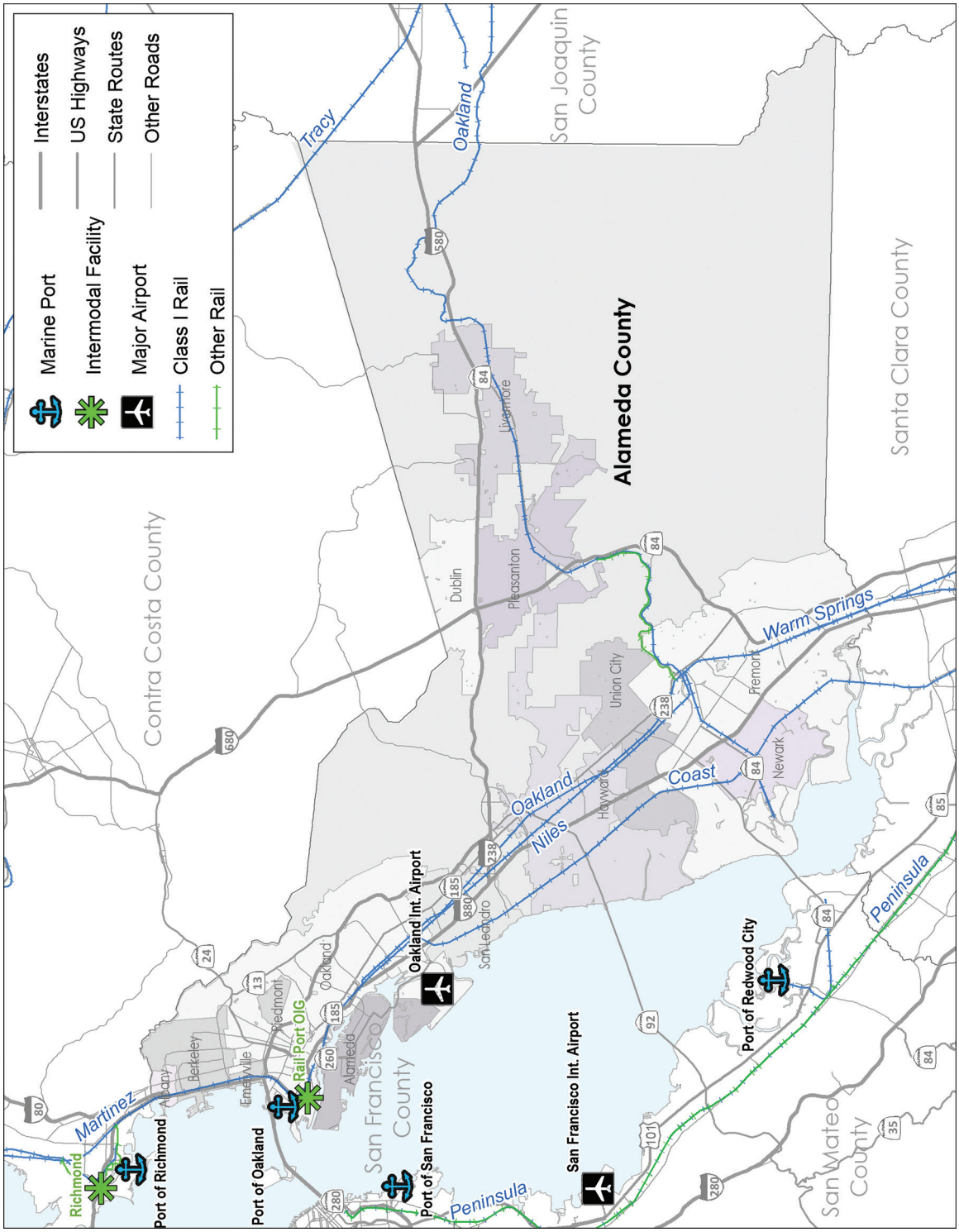


Figure 4.2 Alameda County Multimodal System Map

Source: Cambridge Systematics, Inc.

Figure 4.3 Bay Area Global Gateways and Connecting Corridors



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

Oakland International Airport also is a critical component of the goods movement system in Alameda County; it is the second busiest domestic air freight airport in the State, home to a major FedEx hub, and critical for high-value goods movement shipments and the growing e-commerce sector.

4.2 Interregional and Intraregional Corridors

The inter- and intraregional corridors consist of primary highways and rail lines that serve to connect the central Bay Area and Alameda County to the rest of the State and to domestic markets. This network provides primary access to major facilities, such as the Port of Oakland and Oakland International Airport, rail yards, and warehouse/industrial districts.

4.2.1 Highways Corridors

Key interregional and intraregional truck corridors in Alameda County include I-80, I-238, I-580, I-680, and I-880. These corridors carry up to 20,000 trucks of all classes per day on average, performing both long-haul and short-haul truck moves. As shown in Figure 4.4, these routes form the majority of the Tier 1 truck route network (highways and interstates) in Alameda County. The continued relocation of distribution facilities out of Alameda County to locations further east in the Central Valley and the flows of products to the region from these distribution facilities by truck are expected to increase pressure on already congested and limited connections. Given projected truck traffic growth, Alameda County will likely continue to see conflicts between trucks and automobiles on its major highways. Figure 4.5 illustrates the highest truck volumes in the Bay Area; most of which are in Alameda County. The corridors emanating from the Port of Oakland and Oakland International Airport carry the heaviest volumes, especially I-880 going south from these Global Gateways and I-580 thereafter, connecting these truck flows to points east. I-680 also carries heavy truck volumes connecting San Jose and Silicon Valley to the I-580 corridor.

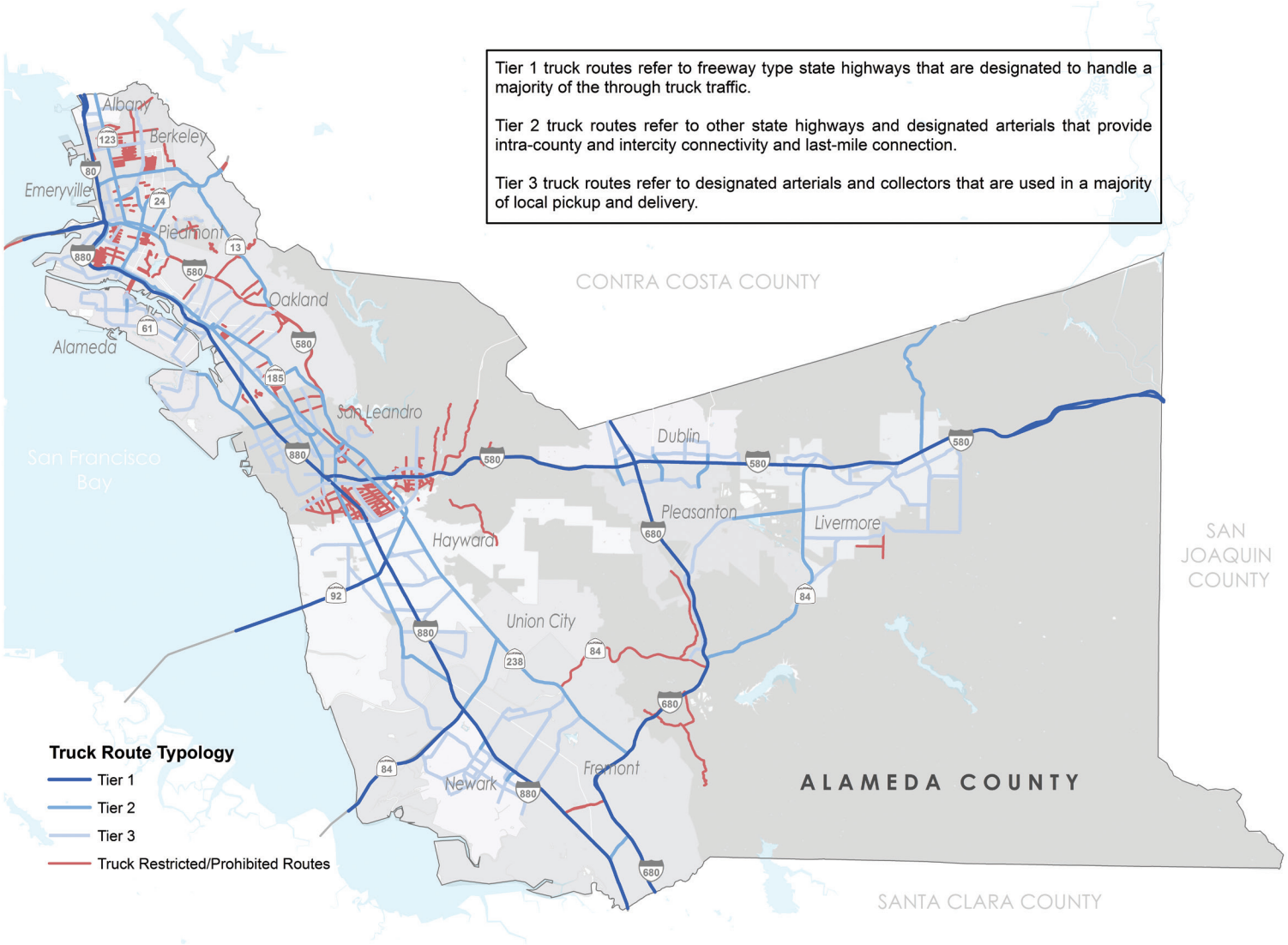
4.2.2 Rail Corridors

Similar to highways, efficient utilization of existing infrastructure is an essential component of railway service planning and marketing. Unlike highways, as private entities, the capacity to deliver current and future freight volumes is what railroads sell. In Alameda County, there are two Class I rail carriers: Union Pacific (UP) and BNSF Railway (BNSF). UP maintains and manages the following subdivisions that have at least a portion of their lines in Alameda County (Figure 4.6): the Martinez Subdivision, the Niles Subdivision, the Coast Subdivision, and the Oakland Subdivision. Many passenger rail services also run on these lines. In the 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 the County's interregional highways. Figure 4.7 zooms out to the Bay Area to show Alameda County rail corridors' importance in the regional context, especially as links to points beyond the region.

In addition to rail lines, Alameda County has two intermodal terminals:[13] UP's Railport – Oakland and BNSF's Oakland International Gateway (OIG). These terminals handle cargo not only from/to Port of Oakland but also domestic cargo. A third terminal – the Outer Harbor Intermodal Terminal – is proposed as part of the Oakland Global Logistics Center.

[13] Rail yards can be classified based on the type of trains handled as: 1) intermodal terminals – for containers or truck trailers on flat cars or specialized intermodal cars; 2) rail classification yards for carload traffic – for grain, coal, and similar bulk commodities moving in unit trains, or general merchandise commodities moved in box cars and tank cars; and 3) automobile yards – for assembled automobiles, vans, and trucks moving in multilevel cars.

Figure 4.4 Alameda County (Truck Routes and Truck Restricted/Prohibited Routes, *2014*

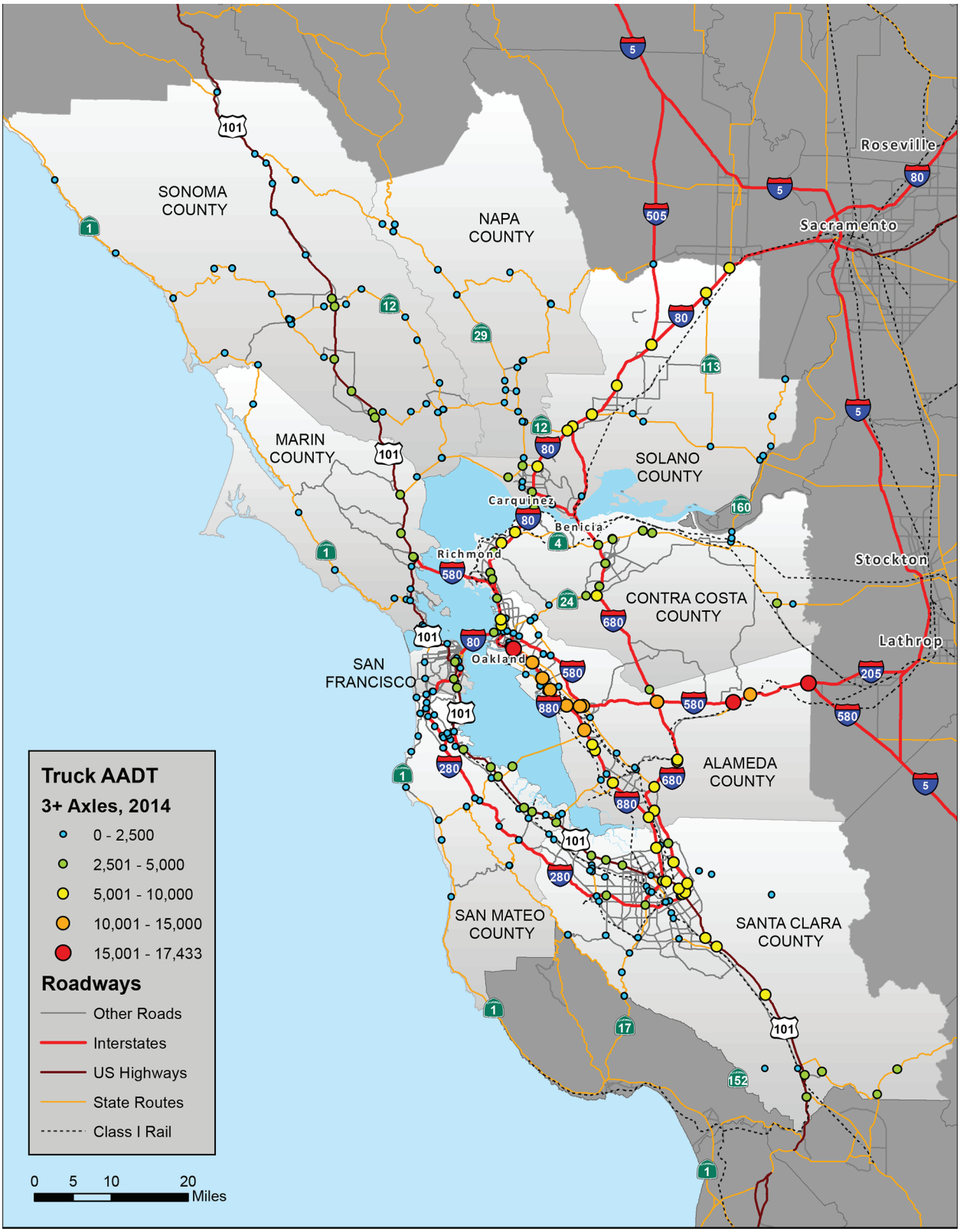


Source: Cambridge Systematics, Inc. analysis; Truck Routes and restriction information collected from and reviewed by cities.

Note: Interactive map can be access here: ags.camsys.com/ACTCGoodsMovement/.

4 Goods Movement Systems

Figure 4.5 Bay Area Truck Volumes (Three plus Axle), *2014*



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

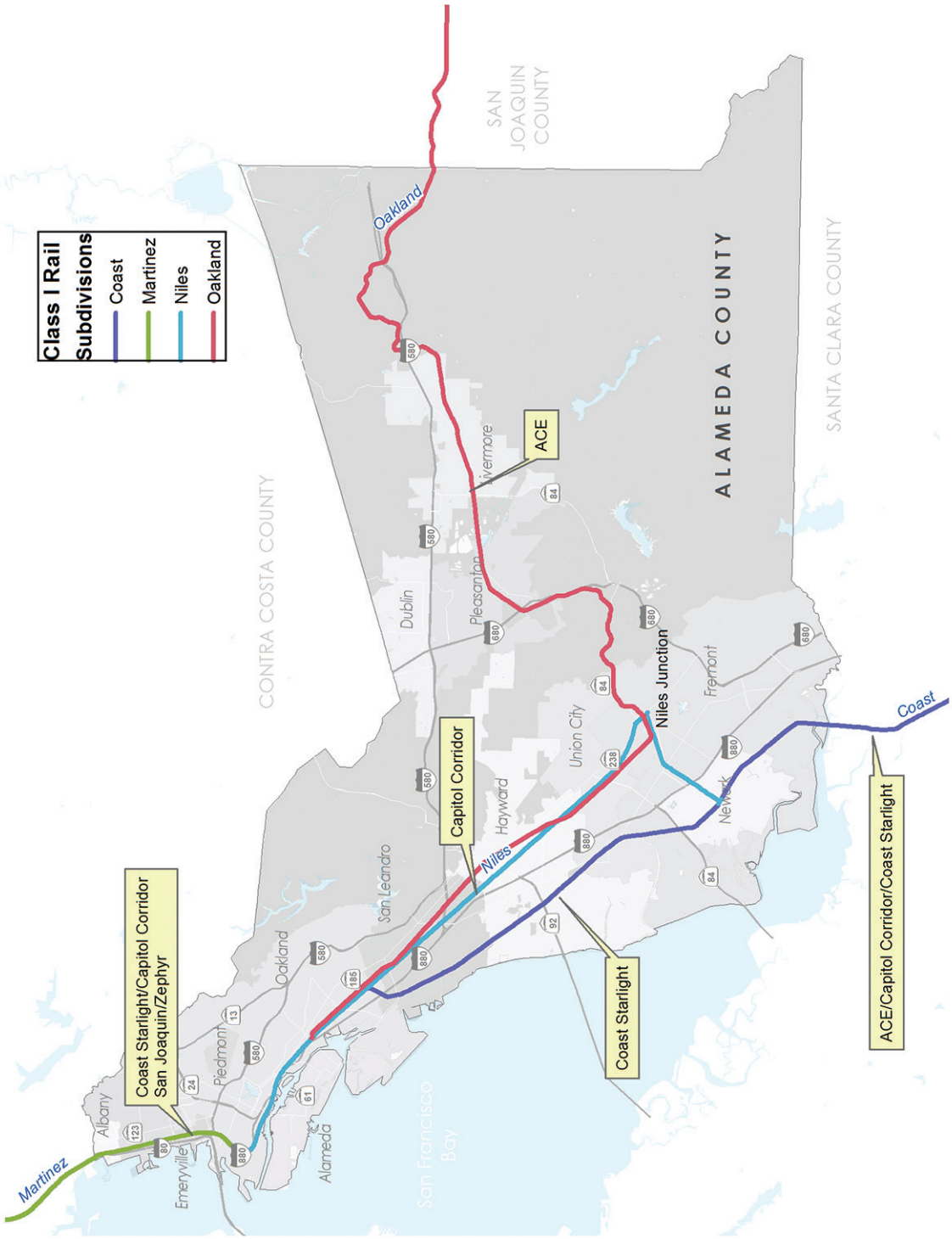
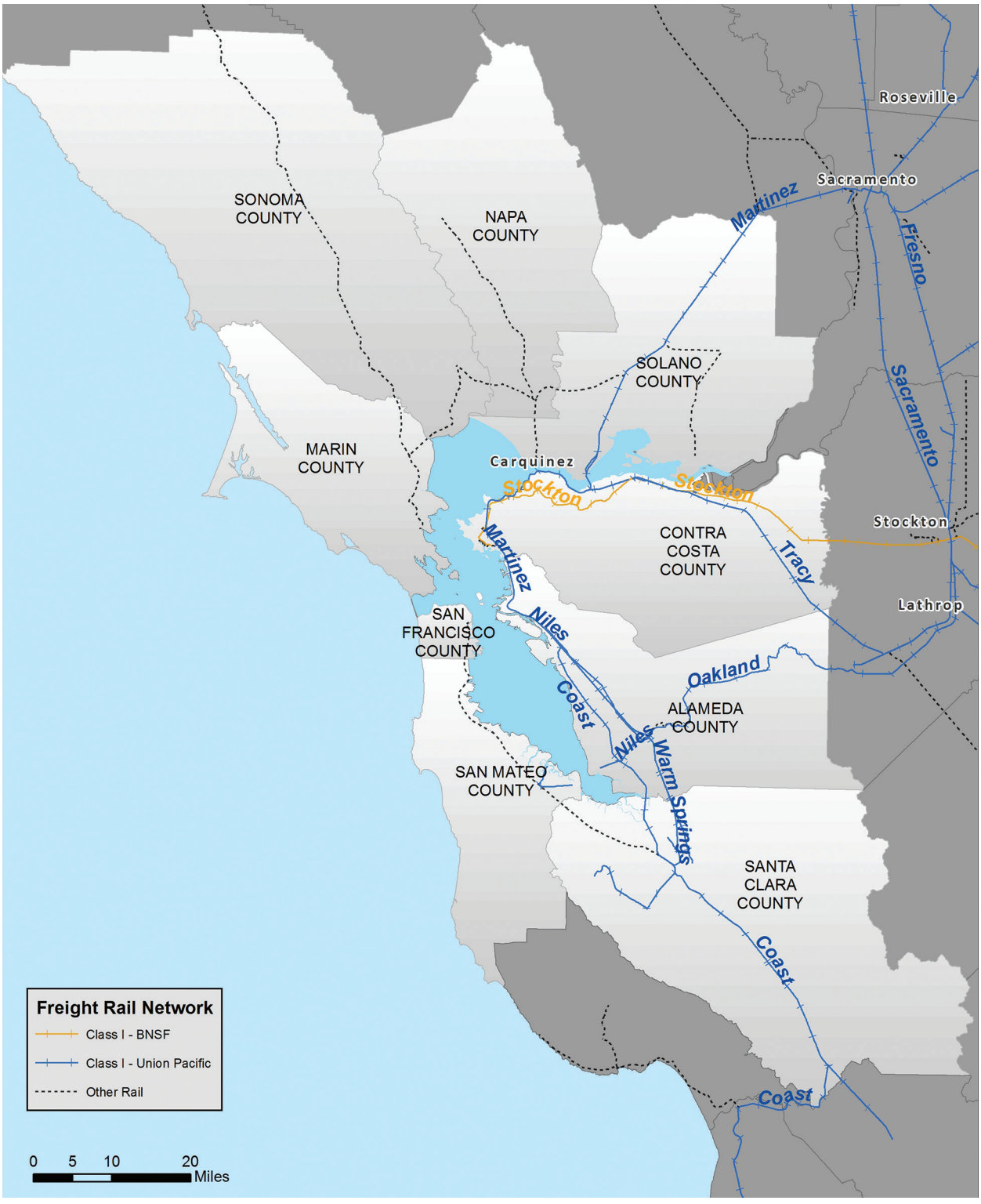


Figure 4.6 Alameda County Freight Rail Lines, *2014*

Source: Cambridge Systematics, Inc.

4 Goods Movement Systems

Figure 4.7 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 also are part of the local goods movement system, providing the critical connections between major freight facilities and the interregional and intraregional systems. The local goods movement system consists of Tier 2 and Tier 3 truck routes as seen in Figure 4.4 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 also are a vital part of the local goods movement system and serve important economic functions.

Truck Route System

As part of this Plan, through analysis and an extensive outreach process, a truck route system was mapped out in Alameda County consisting of three tiers:

1. Tier 1 truck routes refer to state highways that are designated to handle a majority of the through truck traffic
2. Tier 2 truck routes refer to other state highways and designated arterials that provide intracounty and intercity connectivity and last-mile connection
3. Tier 3 truck routes refer to designated arterials and collectors that are used for a majority of local pickups and deliveries

In addition, there are restricted routes in many of the cities in Alameda County. The routes may be subject to weight, length, or commodity restriction.



Chapter 5

Gaps, Needs, Issues and Deficiencies

5 Gaps, Needs, Issues and Deficiencies

Overall, Alameda County's goods movement system supports a vibrant economy, enabling commerce and development of new industries. However, there are challenges that must be addressed in light of the various growth trends discussed in earlier chapters. This chapter identifies the most important gaps, needs, issues, and deficiencies of each function of the Alameda County goods movement system as they relate to the vision and goals described earlier. Performance measures were used to evaluate the needs in a systematic manner that directly relates to the goals. This also is important to link the needs to strategies. As strategies were developed to address the needs (described in Chapter 6), the performance measures were used to rate the strategies with the highest rated ones included in opportunity categories. It should be noted that several case studies also were conducted that focused on specific issues included in this section of the report. While summary-level information for each case study is provided in this section, more detailed information can be found in *Appendix I: Needs Assessment Case Studies.*

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 on-going performance. They also can be used to help decision makers allocate limited resources more effectively than would otherwise be possible.

5.1 Global Gateways Challenges and Needs

After years of declining share of West Coast trade, the Port of Oakland has seen its market share begin to grow and return to prerecession levels. A map of the Port of Oakland is shown in Figure 5.1. The Oakland Global Logistics Center 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. These issues represent some of the most important goods movement challenges in Alameda County. The Oakland International Airport currently does not face significant capacity constraints or issues, though local access routes can be improved. In addition, one of the critical needs at the Airport is the building of a dike to prevent runway flooding that could become more critical in the future as a result of climate change impacts.

5.1.1 Port of Oakland Operations Challenges

While the Port of Oakland is "Big Ship Ready," the sudden surge in bigger post-Panamax ships is creating unintended consequences, not only for the port-side operations, but also land-side operations. A large vessel offloads in one day the same amount that a terminal once typically handled over the course of two to three days, which creates bottlenecks and causes 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

Figure 5.1 Port of Oakland Terminal Complex Map



Source: Port of Oakland Web site.

decreased efficiency in terminal operations (see Figure 5.2 as an example). The larger vessels also are 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.

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.[14]

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



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

[14] Port of Oakland Staff Interview.

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 Global Logistics Center Project that still needs additional funding.

5.1.4 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). Studies suggest that 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.[15] 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 on the following page – *Case Study 1: West Oakland and Port Development.* It is also important to point readers to the recent report by the Port environmental staff regarding the implementation status of mitigations identified in the Oakland Army Base Redevelopment EIR/EIS.[16] This report by Port of Oakland Staff to the Board of Harbor Commissioners, reports that all of the environmental mitigation measures required by the Oakland Army Base EIR have either been implemented or are being implemented. The only exception to this are measures which will mitigate impacts of components of the projects which are not likely to be constructed in the near future.

5.1.5 Oakland International Airport Challenges

One issue facing the Oakland International 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 sections below sea level, this poses immediate risk. According to current projections, climate change will cause the Bay to rise 16 inches by mid-century and 55 inches by the end of the

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

[16] The Port of Oakland's progress implementing specific mitigation measures is provided in a report to the Board of Port Commissioners, "2015 Mitigation Report for Redevelopment Projects at the Former Oakland Army Base," April 9, 2015.

Case Study 1: West Oakland and Port Development

The proximity of the West Oakland neighborhood to the Port of Oakland and the future Oakland Global Logistics Center 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 they are addressed 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 DPM 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.

century.[17] 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 surges. The temporary or permanent disruption of the Oakland International Airport due to flooding would likely 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, also will be affected.

5.2 Interregional and Intraregional Corridor Needs

Both highway and railroad corridors provide for shared use between passenger 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, 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 and infrastructure design deficiencies in the corridor. The rail system in Alameda County, 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 Alameda County. Truck delays increase the costs of goods movement and also can result in increased truck emissions. In the AM period, locations along I-80

[17] 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.

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



westbound to San Francisco and I-880 northbound to Oakland experience the worst truck delays in Alameda County. I-580 westbound near Livermore also experiences high levels of truck delays. In the PM peak period, truck delay is worst along I-680 northbound near Fremont, I-580 near Livermore, and I-80 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 in population and employment in the Bay Area. Figures 5.4 and 5.5 show the delay conditions in the AM and PM periods respectively.

5.2.2 Highway Safety and Reliability

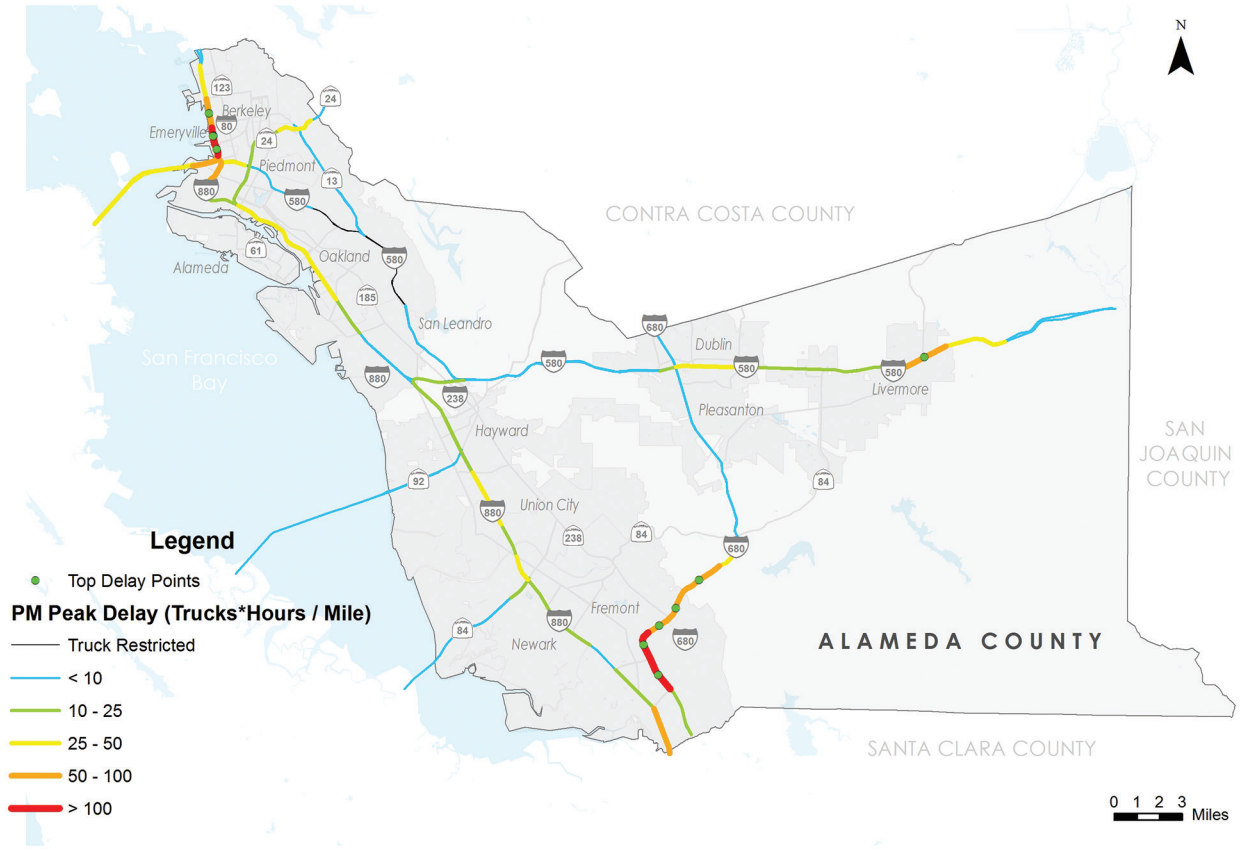
In addition to recurrent delay, or predictable delay, nonrecurrent delay also is important to understand as it is mostly caused by accidents. Highly variable travel times due to nonrecurrent delay are particularly problematic for truckers because they affect on-time performance and, in some cases, truckers may be penalized by shippers for poor reliability. Nonrecurrent 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. In the AM peak, the most unreliable corridor to travel on is I-80 Westbound (WB), where an additional 67 percent of travel time must be budgeted into a trip to have high confidence of arriving on time, should a trip traverse the entire corridor. I-580 WB and I-880 Southbound (SB) also have poor truck reliability. By contrast, travel on I-80 Eastbound (EB) in the morning period is quite reliable. In the PM

Figure 5.4 Top 10 Delay Locations, AM Peak Period – *6:00 a.m.-10:00 a.m., 2010*



Source: INRIX 2014; Alameda County Truck Travel Demand Model; PeMS, Cambridge Systematics analysis.

Figure 5.5 Top 10 Delay Locations, PM Peak Period – *3:00 p.m.-7:00 p.m., 2010*



Source: INRIX 2014; Alameda County Truck Travel Demand Model; PeMS, Cambridge Systematics analysis.

peak period, a different picture emerges. Both I-80 EB and WB, I-680 NB, and SR 24 are very unreliable in the PM time frame.

In Alameda County, the worst crash spot is at I-580 WB at the I-680 interchange, with 29 truck-involved crashes in the five-year period from 2008 to 2012, and I-880 and I-580 are generally high truck-involved collision corridors. While there are significant interchange improvements planned on I-880, such as the I-880 North Safety and Operational Improvements at 23rd and 29th Avenues, 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, including truck drivers, will be needed. Currently (and historically), the trucking industry faces challenges to hiring and keeping drivers, and the American Trucking Associations (ATA) predicts that a driver shortage is "looming."

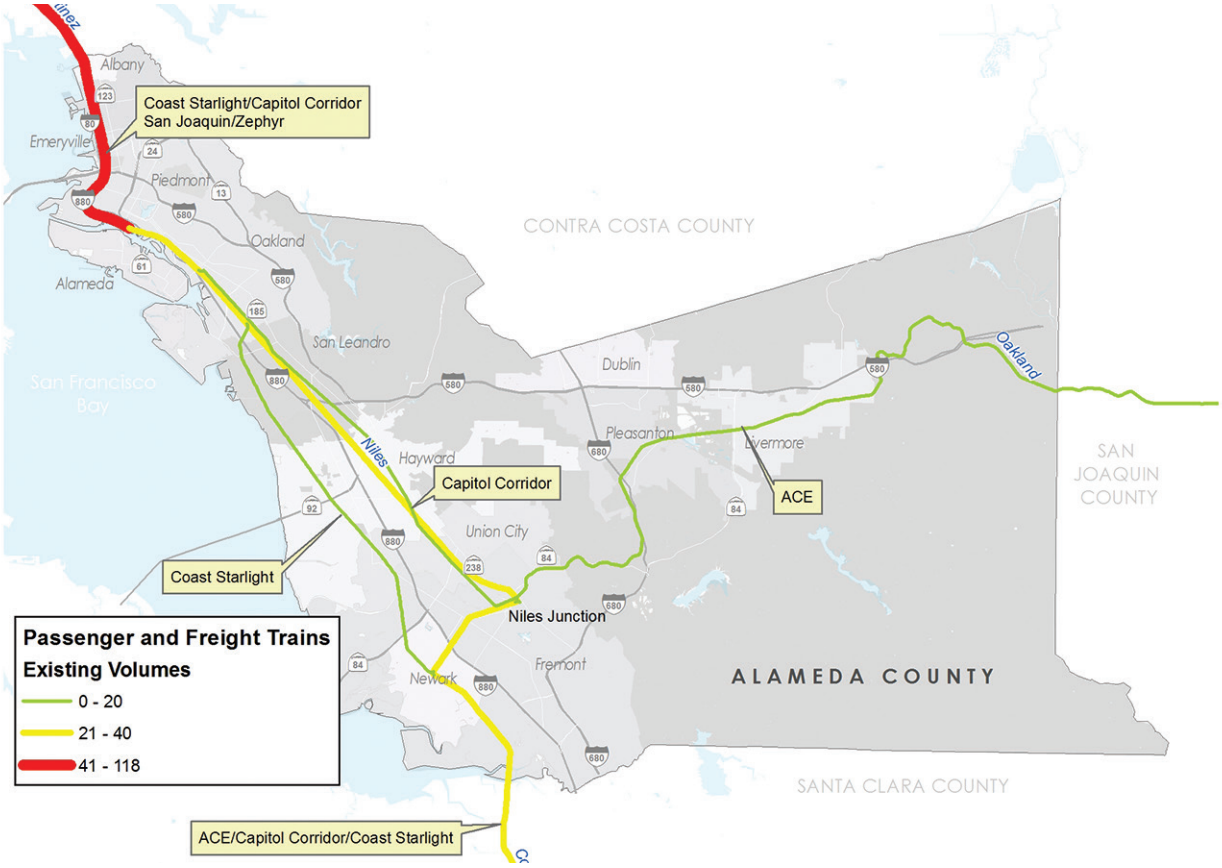
In Alameda County, this issue arose during stakeholder interviews. The Alameda County Workforce Investment Board has studied industry clusters that are facing new trends related to the workforce; and in their recent Industry Data Briefing (June 2014), drivers and truckers that support the transportation logistics industry were

studied. The report reviewed demand for drivers and truckers in the region by the number of on line 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. It is clear that a combination of strategies must be adopted to fill the driver shortage gap. Efforts to improve port operational efficiencies could have secondary benefits in terms of increasing the attractiveness of port drayage trucking.

5.2.4 Rail Corridor Capacity and Connectivity Needs

The existing railroad network in Alameda County and the adjacent Bay Area counties has sufficient capacity to accommodate current train volumes without excessive delays (Figure 5.6). The UP Martinez Subdivision is the most constrained segment between Richmond and Oakland, and 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.

Figure 5.6 Existing Train Volumes on Rail Lines in Alameda County

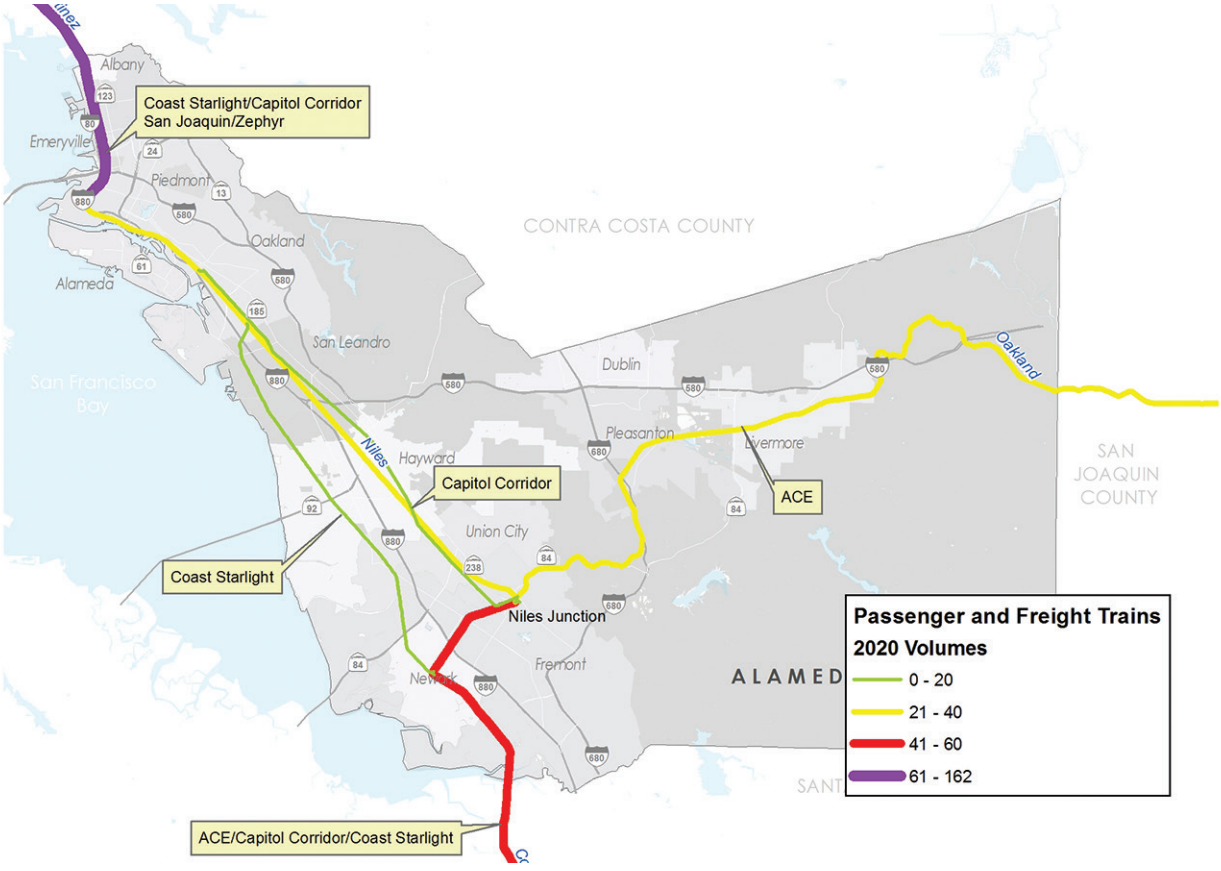


Source: AECOM Calculations.

One major driver of change in rail volumes and flow patterns are the plans for the Oakland Global Logistics Center. 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 5.7). 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).

The Alameda County rail network also has a connectivity issue whereby trains heading between the Central Valley and the Port of Oakland cannot make a direct connection from the Oakland Subdivision to the Niles Subdivision at Niles Junction. This gap results in many freight trains being routed via the Coast Subdivision.

Figure 5.7 Year 2020 Train Volumes on Rail Lines in Alameda County



Source: AECOM Calculations.

Table 5.1 Rail Lines 2020 Forecast Level of Service in Alameda County Area

Subdivision	From	To	Number of Main Tracks	Total Daily Trains	Average Capacity	V/C Ratio	LOS
UP Coast	San Jose	Newark	3/1	42	30	140.0%	F
	Newark	Oakland	1	10	18	55.5%	C
UP Martinez	Sacramento	Martinez	3/2	56	75	74.7%	D
	Martinez	Richmond	2	66	75	88.0%	E
	Richmond	Emeryville	3/2	74	75	98.7%	E
	Emeryville	Oakland	2	72	75	96.0%	E
UP Niles	Newark	Niles	2	44	75	58.7%	C
	Niles	Oakland	1	26	30	86.7%	E
UP Oakland	Niles	Stockton	1	23	30	76.7%	D
BNSF Stockton	Stockton	Port Chicago	2/1	22	30	73.3%	D

Source: AECOM calculations.

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, crossings 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 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 done 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 (such as a design that prevents encroachment on tracks when a train is present).

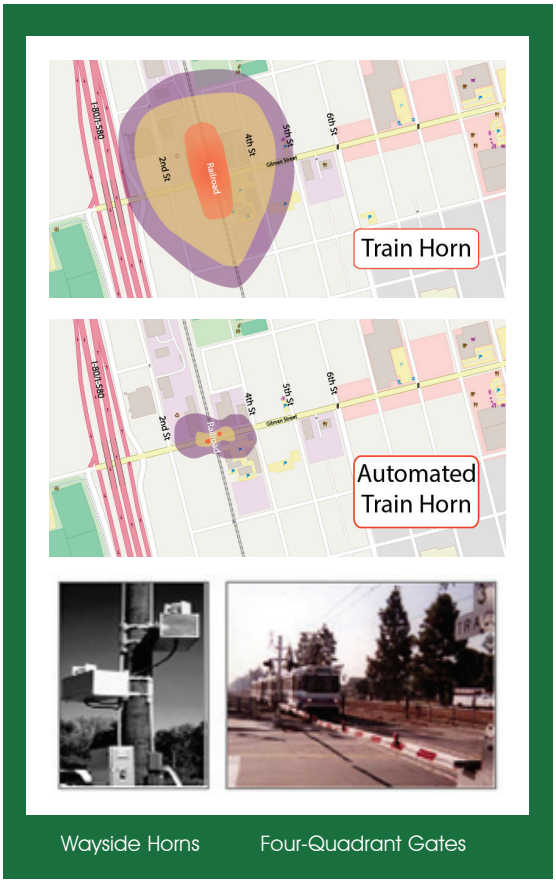
Given that the Martinez subdivision (along the I-80 corridor) has the highest volumes and traverses many residential neighborhoods, a detailed case study was done to document community impacts along the I-80 rail corridor, including noise impacts, as outlined in *Case Study 2: I-80 Corridor Rail Impacts.*

5.2.6 Preserving Freight Corridors for Industrial Access

Critical freight corridors in Alameda County, the locations where much of the rail infrastructure is located and where major interregional and intraregional truck corridors are located, also are corridors that tend to have the greatest concentrations of transit infrastructure. Many of these freight corridors pass through PDAs. The combination of increasing freight movements through these corridors and increased residential and commercial development is leading to land use conflicts, such as residences abutting major truck routes, which will need to be addressed with guidance to cities for how to effectively buffer communities from freight activity.

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.



Wayside Horns Four-Quadrant Gates

- **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.

- **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 is 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 prioritized 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 Alameda County. Local streets and roads are operated and maintained primarily by the cities in Alameda County (and the County for roads in the unincorporated areas), 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, and Alameda CTC is developing the first-ever Multimodal Arterial Plan that addresses the needs of all modes on major arterials throughout the County. The key issues identified with local streets and roads include connectivity gaps, modal conflicts, land use conflicts, and truck parking issues.

5.3.1 Connectivity Needs

In Alameda County, the major warehouse and industrial areas, the Port of Oakland, and Oakland International Airport all have generally good connectivity to the Tier 2 and Tier 3 networks; and there often are redundant routing options. However, there are connectivity issues at specific locations, such as to I-580 from the industrial warehouse area in Pleasanton, access to Fremont industrial area from Mission Boulevard, lack of connectivity between East County and the other planning areas, and need for better connectivity to/from the I-880 West industrial areas. In these locations, there is no designated truck route meaning that trucks either travel out of direction or alternatively may end up using roads that are not designed to accommodate them. Some of these connectivity issues are examined in *Case Study 3: Central County Industrial Access.*

5.3.2 Modal Conflicts

In recent years, there has been a movement throughout the country to develop Complete Streets[18] plans to accommodate all modal users, and Alameda CTC and MTC have required cities to adopt Complete Streets policies in order to be eligible for certain funding sources. However, at this time, most of the Complete Streets guidance and standards provide little information about how to accommodate goods movement. One of the key conflicts noted was potential transit conflict due to the new planned Bus Rapid Transit (BRT) routes on International Boulevard. Much effort has been devoted to addressing the need for continued truck access and truck parking to serve businesses on International Boulevard, and the solutions may provide a model of how to effectively coordinate transit and truck usage of the same major arterial route. These issues are highlighted in *Case Study 4: Designing for Goods Movement as part of International Boulevard BRT project.*

5.3.3 Land Use Conflicts

Most of the Tier 2 truck routes pass through residential areas. This is because these routes provide intercity connectivity for trucks over relatively long distances, and as such, they will inevitably pass through land use transitions. This cannot be avoided, and the best practices for accommodating truck movements and Complete Streets will need to be applied in these cases. The following locations are examples where identified truck routes are at the boundary between industrial land uses and residential land uses:

- East 7th Street, 8th Street, and 12th Street in Oakland;
- Whipple Road and Alvarado Niles Road, and Decoto Road in Union City;
- Industrial Boulevard in Hayward; and
- Cherry Street in Newark.

[18] Complete Streets is a transportation policy and design approach that requires streets to be planned, designed, operated, and maintained to enable safe, convenient, and comfortable travel for all users regardless of their mode of transportation.

Case Study 3: Central County Industrial Access

Central Alameda County and the Cities of San Leandro, Hayward, and Union City are home to a significant portion of the County's industrial activity. Adjacent to the major freight freeway junction at I-880 and I-580/SR 238, the area is a hub of the interregional trucking network, linking the Port of Oakland and Oakland International Airport with the Central Valley and the California coast. Key arterial routes in this area include Mission Boulevard connecting Hayward and Union City with Newark and Fremont; and Hesperian Boulevard connecting Union City, Hayward, and San Leandro.

Several specific issues affect truck movement through this area, and affect residential and commercial land uses as well as industrial. These issues, along with strategies to address them, are discussed below.

- **Truck route continuity.** Truck routes are not contiguous through the area, affecting connectivity from the freeway to industrial areas, diversion from I-880 to local streets, and spillover impacts on adjacent neighborhoods. Whipple Rd near the Union City/Hayward border and San Leandro St. near the Oakland/San Leandro border are two examples of gaps in appropriate truck routes between major industrial districts and hindrances to availability of reliever routes during freeway congestion. Truck routes along Hesperian Blvd and International Blvd pass through residential neighborhoods and other noncompatible uses. Resulting truck traffic generates noise and emissions on local residents and businesses. As part of this plan, a program is recommended to provide Truck Route Coordination Planning/Guidance, Technical Assistance, and Information to Address Truck Route Connectivity, and Health and Community Impacts.

- **Truck parking.** As a hub of interregional trucking routes, a high demand for truck parking exists in this area, but is not met by sufficient supply. Trucks resort to parking on local streets, inconveniencing residents and businesses. The situation is exacerbated by Federal rules limiting the number of hours a driver can drive per day and week (hours of service regulations), and increasing the amount of required down time and need for truck parking. Truck companies increase fleet sizes in response, furthering the need for truck parking. Development of public or public-private truck parking and full-service truck service facilities near major industrial centers is recommended as a strategy in this plan.

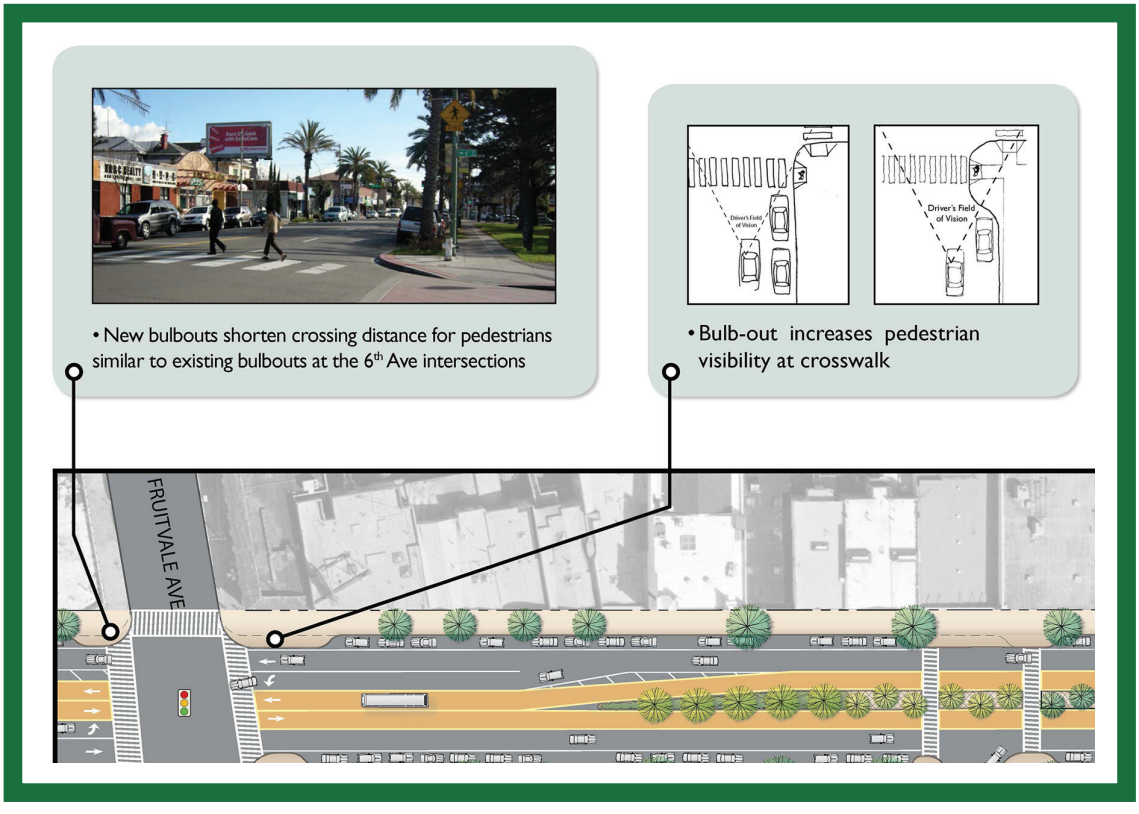
- **Truck diversion.** Heavy congestion on local freeways causes many trucks to seek alternate routing on Hesperian, Mission, Union City, and International Blvd, as well as Clawiter Rd, Doolittle Dr, and Wicks and Lewelling Blvds. Resulting poor levels of service on these surface streets cause further diversion to other local streets. An arterial smart corridor strategy is proposed as part of the plan that include ITS infrastructure for integrated corridor management on the freeways, capital projects to improve freeway capacity and interchange operations, adaptive signal timing on arterials, and completing connections of local truck routing.

Case Study 4: Designing for Goods Movement as Part of International Boulevard Bus Rapid Transit project

International Boulevard is an important multimodal corridor through East Oakland and San Leandro. Traversing commercial and industrial land uses, as well as residential, it is a locally important transit route and goods movement route. It provides access to Fruitvale and San Leandro BART stations, and serves two of the three busiest Alameda Contra Costa Transit District (AC Transit) routes (Lines 1 and 1R), as well the overnight Line 801. A planned Bus Rapid Transit (BRT) route will operate alongside existing bus service, and is expected to begin operations in 2016. The vast majority of trucks in the corridor are small (80 percent single unit and 13 percent four-axle), delivering consumer goods to retail, services, and office facilities. Connection to I-880 to the west is important as the major regional goods movement route.

While the planned BRT route will improve transit along this very busy line, it does create several issues for truck movement; these have been anticipated and thoughtfully designed as part of the project to ensure continued truck access to the corridor, which is why it is highlighted in a case study here.

- **Removal of traffic lanes.** Currently, most segments of International Blvd have four traffic lanes. With BRT, this will be converted to only two traffic lanes, which significantly reduces truck mobility. To address this, the parallel routes of East 12th St. and San Leandro St. are being



Case Study 4: (continued) Designing for Goods Movement as Part of International Boulevard Bus Rapid Transit project

promoted as alternative and more effective truck routes. The connection between East 12th St. and San Leandro St. near Fruitvale Ave also will be improved to facilitate this.

- **Removal of parking spaces and loading zones.** Curbside parking and loading zones exist along most of the corridor now. These will be significantly reduced to make way for BRT stations and pedestrian bulb outs at intersections. To overcome this, remaining loading zones and adjacent red zones along International Blvd will be extended in length to accommodate maneuverability of trucks (further reducing general parking) and side street parking increased.
- **Removal of left-turn lanes.** The number of intersections where left turning is allowed will be significantly reduced. As a strategy to overcome this, left-turn lanes will be provided every several intersections, and protected left-turn signal phasing will be installed at the key intersections.

In general, by understanding the potential conflicts for freight that can occur, specific strategies can be adopted to address them to the extent possible. In addition, shifting truck-route designation to parallel routes that are more suitable for freight movement, such as San Leandro St, also should be incorporated in designating the County's truck-route system.

In most cases, these truck routes are important for access to industrial/warehouse zones, and there are no logical alternatives for designating truck routes. While buffers, including light industrial, retail, or mixed-use development zones (especially if parking and visual screens such as trees can be placed along the boundary between the industrial zones and the residential zones), are preferred to directly contiguous industrial and residential zones, in many cases, legacy land use decisions have created these land use conflicts, and proper truck management is the only course of action for the future. *Case Study 3: Central County Industrial Access* also highlights these land use conflicts issues in the Central County industrial area.

5.3.4 Truck Parking Needs

Most parking of trucks is not in the public eye because it occurs on private property. However, when parking occurs on public property (such as on freeway on-/off-ramps or in residential areas) community concerns may be raised. While earlier sections address parking needs and strategies associated with Port of Oakland, this section discusses parking needs within communities for deliveries.

A growing issue in the urban goods movement system is the increasing amount of delivery traffic in busy downtown districts and in neighborhoods, as highlighted in the Central County Industrial Access Case Study. This is resulting in insufficient loading and unloading spaces, double-parking or illegal parking of trucks, and encroachment of trucks in neighborhoods. This also creates conflicts between trucks and other users of the urban street system. In order to develop strategies to address this issue, it is important to understand the time-of-day patterns of trucks and other urban street users to see if changes in time-of-day

restrictions could reduce conflicts and more effectively use limited urban street right-of-way. Another aspect of this problem is creating requirements for off-site access and loading areas in densely populated areas. Many cities are beginning to experiment with a variety of strategies to address this issue, including the development of package and parcel consolidation centers or local pick-up/drop-off centers for urban parcel delivery, night-time delivery, and time-of-day street controls.

In addition, shortage of corridor-level long-haul parking needs and impacts from recently enacted federal Hours of Service Regulations also exacerbate the issue. By reducing the truck drivers' work week by 12 hours, the productivity of each truck is reduced. This increases the number of trucks on the road and can lead to increased congestion. In a 2008 Truck Parking Study,19 truck operators in Alameda County reported that they experienced significant shortages of space for parking their trucks. Drivers surveyed noted that preferred locations for stops (greatest needs) were on I-880 and I-238 in Hayward, Oakland, San Leandro, and San Lorenzo. They also noted that, when feasible, they planned their trip to allow them to get out of the Bay Area by evening, in large part, because of the lack of known, desirable locations where they can "spend the night." A lack of truck parking facilities may result in illegal or undesirable parking in neighborhoods as well as loss of economic activity from associated supportive services that could be provided to truckers.

5.3.5 Local Road Safety Needs

Truck safety is an issue for both truck drivers and users of the roadway. In Alameda County, while truck-involved crashes made up about four percent of total injury crashes, they comprised a higher percentage of fatal crashes in all years from 2008 to 2012, except one. This indicates that truck-involved crashes are more severe. In general, the locations (clusters) with the highest number of truck-involved crashes average no more than 10, with most locations having only 1 or 2 crashes from 2008 to 2012. However, local roads around the I-880 north industrial area and I-580 interchanges have higher truck-involved crashes. Proximity to interstate highway on-/off-ramps seem to be a recurring factor for the crashes.

In addition to looking at existing crash patterns, it is important to understand potential safety issues in the future. To elaborate, safe access on local and rural roads is increasingly important, as they connect to agriculture and other key industries and is usually the only lifeline to bring the goods to market. To better understand this, *Case Study 5: Tesla Road* was carried out to understand safe access needs.

[19] Truck Parking Feasibility and Location Study – Final Report, Tioga Group, Inc., 2008.

Case Study 5: Tesla Road

Tesla Road just south of Livermore in eastern Alameda County serves as an example of issues for truck access on high-speed rural roads. This two-lane road with shoulders and bike lanes runs less than three miles from Concannon Road to Greenville Road, providing access to eight vineyards that employ up to 400 people. Agricultural uses and several other vineyards are located in close proximity; and two other major employers, Lawrence Livermore National Laboratory and Sandia Laboratory, lie just to the north. Two signalized intersections exist on Tesla Road at Mines Road and South Vasco Road, while other intersections are controlled by side-street stop signs. Speed surveys report 56 mph as the 85th percentile speed. Peak traffic occurs between August and October during peak vineyard harvesting. Average daily traffic is recorded as 10,000 in late August, with 20 percent of this occurring between 5:00 a.m. and 7:00 a.m. Only 1 percent of this traffic is trucks with three or more axles.



Existing Cross Section



Bike Lane on Greenville Road

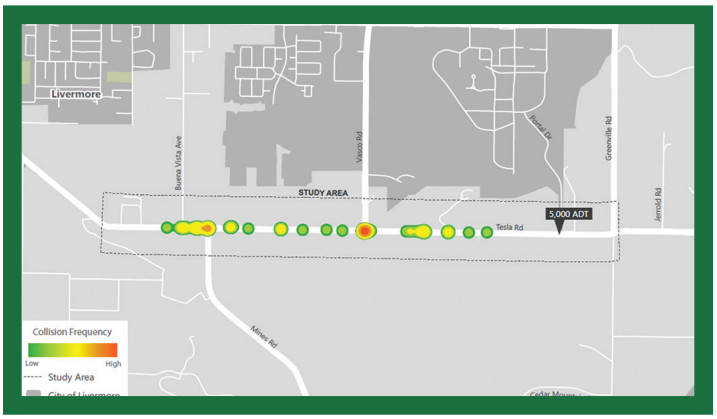


Truck Stop along Tesla Road



Truck Traffic on Tesla Road

The major concern along Tesla Road is collision frequency at driveways entering the vineyards. Heavy trucks serving the wineries have to enter and leave Tesla via unsignalized intersections that do not have protected turn pockets or accelerations/deceleration lanes. The speed differential between through-moving passenger cars traveling at over 50 mph and trucks slowing to make turns – or accelerating from driveways onto the main road – causes safety concerns forth both general traffic and business access. Most collisions are related to turning vehicles or rear-end collisions. Some possible solutions to address this include investigating the feasibility and cost/benefit of driveway consolidation for truck access to wineries, as well as for left-turn pockets and truck deceleration lanes. Additionally, a performance speed zone study should be conducted to determine whether slower speed limits are warranted along the corridor, or improved signage for truck access and speed reduction.





Chapter 6

Opportunities

6 Opportunities

In order to address the needs, deficiencies, and gaps in Alameda County's goods movement system, a wide variety of strategies – projects, programs, and policies – was proposed and evaluated using the performance measures developed for this plan and incorporated into three opportunity categories – all of which are needed to meet the vision and goals of this Countywide Goods Movement Plan. These opportunity categories form the core of the Countywide Goods Movement Plan, and they show how different strategies can be coordinated during implementation to realize important synergies. The categories allow Alameda CTC and partner agencies to communicate the important objectives of the Plan to outside funding agencies and policy-makers at the regional, state, and federal levels.

A key element of the opportunity categories is the concept of the "balanced portfolio." Each of the strategies contained in an opportunity category was evaluated with reference to the performance measures developed for the plan, and only highly rated strategies are included in the final opportunity categories. 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 into categories is to ensure the category, 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" to ensure the vision and goals of the plan are met. All three opportunity categories are essential for Alameda County, since each one focuses on different goods movement system needs. It should be noted that while the opportunity categories aim to achieve balance between different goals, projects, and programs would still undergo environmental review that identifies specific mitigation measures. Further, whereas environmental review generally ensures that measures mitigate impacts from new activity, the strategies in the opportunity categories could also seek to address existing freight impacts in communities. These strategies are dealt with in greater detail in Appendix K: Strategy Evaluation Results.

6.1 Opportunity Category 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 Global Logistics Center/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 have seen with the loss of traditional manufacturing.

The redevelopment of the Oakland Army Base into the Oakland Global Logistics Center 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 EIR estimated that more than 2,600 direct local jobs would be created by the new logistics facilities.

Supporting the local community. One of the most important aspects of this opportunity category is to reduce existing impacts on communities to a healthful level, and reduce additional impacts that can result from growth. Historically, these impacts have included diesel pollution; noise from trucks, trains, and port activities; and nuisance and safety effects from spillover truck traffic in adjacent neighborhoods. Public and private entities should adopt the wide range of emerging technologies and operating practices for rail (including Tier 4 locomotives), 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 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. CARB



and CalSTA can support these efforts by negotiating with the rail operators to spur rapid adoption of Tier 4 locomotive technology in the Bay Area. It should also be noted that several of the projects in this Opportunity Category are included in the Oakland Global Logistics Center project at the former Oakland Army Base and these projects were previously studied in an Environmental Impact Report as required by the California Environmental Quality Act (CEQA). The CEQA review specified a program of measures to mitigate the impacts of the Oakland Global Logistics Center project and these measures are being implemented, as required, by the City of Oakland and the Port of Oakland.[20] The impact reduction strategies included in this opportunity category address public health and quality of life issues associated with other goods movement sources beyond those planned for the Oakland Global Logistics Center.

This opportunity category also proposes to move an increasing share of the cargo moving to and from the Port by rail rather than truck. Sufficient data does not exist to explicitly forecast the relative emissions of truck versus rail due to the proprietary nature of some of the rail operating data. However, the Department of Energy's "Transportation Energy Book" shows that on a national basis, rail is more than 10 times as energy efficient (per ton-mile) than trucking and this reduced energy usage has been shown to also have similar air quality benefits when modern locomotives are used.

There also 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 make sure the jobs go to those that are in the communities affected, and, to a large extent, the success of such local hiring program 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 impact or local business areas, surpassing 50 percent. In addition, $141 million in wages were earned by these residents.[21]

Increasing Competitiveness by Improving Rail Access. Strategic improvements to the freight rail system to and from the Port and adjacent logistics facilities also will 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. This will include working with the railroads to identify ways to deploy the cleanest available locomotive technologies.

This Plan generally recommends that Alameda CTC and partner agencies and jurisdictions proactively plan for growth in freight rail accessing the Port to be accommodated via the southern route (Niles and Oakland Subdivisions), as opposed to the northern route (Martinez Subdivision). 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 reroute some of the growth in intermodal traffic to the southern route (where it can be

[20] The Port of Oakland's progress implementing specific mitigation measures is provided in a report to the Board of Port Commissioners, "2015 Mitigation Report for Redevelopment Projects at the Former Oakland Army Base," April 9, 2015.

[21] Statistics provided by Port of Oakland.

Benefits of Rail Transloading

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 Global Logistics Center Phase 2 project will provide increased warehouse and logistics space; some of which will support transloading activities. The logistics center 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 Oakland Global Logistics Center 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. 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 reduce these truck trips helping to lower 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.
- 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 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.

accommodated within existing rail right-of-way). Thus, projects along the southern route of Niles and Oakland Subdivisions are recommended in the category instead.

Figure 6.1 is a graphical illustration of this strategy. The last scenario that represents the transload import market under the global competiveness category shows reduction in truck trips on I-880 and I-580 compared to what they would be without the rail strategy.

Table 6.1 summaries the strategies recommended for this opportunity category

Figure 6.1 Graphic Illustration of Rail Strategy

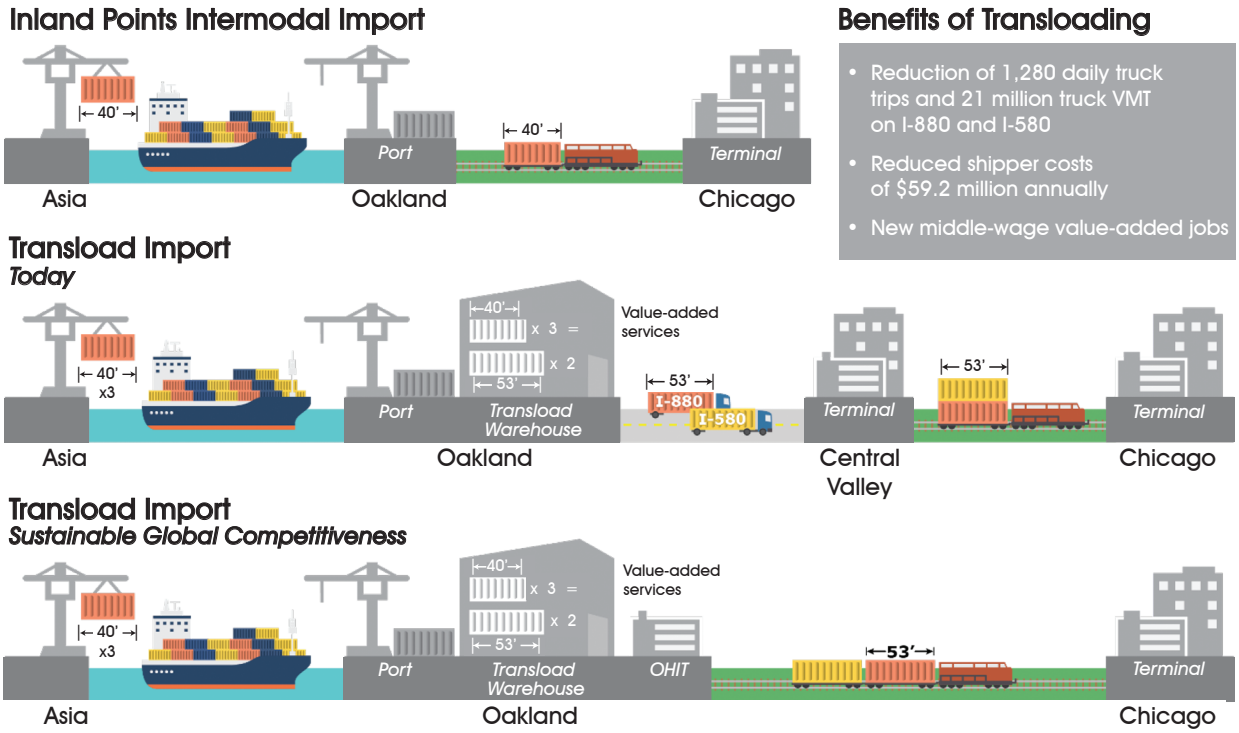


Table 6.1 Opportunity Category 1: Sustainable Global Competitiveness Strategies

Project Description and Project Elements	Additional Information
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. The west project includes construction of an elevated 7th Street/Maritime Street intersection and a tail track extension for the BNSF OIG intermodal yard that facilitates the expansion and reconfiguration of OIG. The east project will increase capacity of the rail bridge over depressed 7th St. between I-880 and Maritime St.
Oakland Global Logistics Center Phase 2 improvements (Port development)	This project includes building of new warehouses, upgrade of utility infrastructure, access road, gates and intersection improvements at Maritime Street and 14th Street. New facilities will include sustainable design and construction methodologies.
Oakland Global Logistics Center Phase 2 Intermodal Rail Improvements	This project will increase yard trackage to provide annual capacity of 900,000 TEU. It will include 8 new intermodal loading tracks totaling 30,000 ft. It also includes infrastructure improvements for potential future use of electric, highly automated wide-span gantry intermodal yard (WSGIY) cranes to replace terminal-dedicated diesel equipment.

Project Description and Project Elements	Additional Information
Truck Services at Oakland Global Logistics Center	Additional truck parking is mentioned as part of Oakland Army Base Phase 2. This project would be implemented only after reassessment of needs after implementation of Phase 1 truck services if there is a need to move additional truck-supportive businesses out of West Oakland neighborhoods.
Replace Adeline overpass at 3rd St. in Oakland to accommodate overweight trucks	This includes replacement of the existing Adeline St. overpass (over the railroad tracks at 3rd St. and Adeline St.) to reduce the grade of the overpass and improve structure so it can accommodate overweight trucks.
ITS Improvements to Address Queuing at Interchanges along I-880 and on Local Streets to Port Of Oakland	This strategy will include queue detection technology and changeable message signs to monitor queues at gates and to direct truck traffic to the best ramps to avoid local traffic around specific terminals in order to improve safety and reduce congestion.
Airport Perimeter Dike	This project provides flood and shoreline protection to the Airport's main passenger and cargo runway, parts of which are below sea level.
Rail Quiet Zone Program	This program will identify suitable locations, prioritize locations, design, and implement quiet zones.
An initial demonstration followed by targeted incentives to promote adoption of zero and near-zero emissions truck technology for port drayage	The on-going MTC Freight Emission Reduction Study will evaluate feasible applications of zero and near-zero emission technology for port drayage. Initial applications are likely to focus on movement of cargo within the port complex and nearby shippers and 3PLs along the I-880 corridor. The program will conduct feasible applications with an intent to identify incentives for market development.
Rail and Terminal Emission Reduction Program	Program to 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. Additional programs aimed at reducing rail-related emission, particularly targeted to areas with high public health impacts from rail operations.
Freight Corridors Community and Impact Reduction Initiative	New program to fund impact mitigation such as air filtration or vegetated buffers in neighborhoods immediately adjacent to freight facilities where buffers and freight hub relocation are not possible, as discussed in the needs assessment.
Develop/Support Workforce Training Programs for Goods-Movement-Related Jobs (specially transloading and logistics jobs)	A program to support workforce training for goods movement-related jobs, especially for residents of areas most affected by goods movement projects.
A program of Rail Crossing Improvements	This is a program to identify the grade crossings with the highest priorities and seek funding to upgrade them.
A program of Track Additions, Sidings, and New Connections	This program includes a list of projects described below:
Hayward Double-Track (Elmhurst to Industrial Parkway 2nd Track)	Adds second track on Niles Subdivision as part of overall capacity expansion on this line.
Niles Junction Bypass	New rail bridge over Alameda Creek in Niles Junction to allow movement from Oakland Subdivision at mouth of Niles Canyon to Niles Subdivision.
Improvements on the Oakland Subdivision Levels East of Niles Junction	Provisions for additional double tracking in long reaches between sidings to ensure sufficient capacity for UP and ACE growth on Oakland Subdivision.

6.2 Opportunity Category 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

Alameda County's transportation system is predominately built out, with limited opportunities to build new capacity. Thus, the County'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 and reduce queuing inside and outside the Port. 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 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. An initiative that is coordinated with that at the regional level 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 category of projects, programs, and policies can also encompass new technologies and operating practices that will lead to a more sustainable freight system. As noted in all of the other categories 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 category 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, Alameda County 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 category also includes policies to shift port operations to times of day when trucks destined to and from the Port would not directly overlap with commuter traffic. The Port will soon be commencing Saturday operations, but there may be additional opportunities from night or other off-peak port operations. Off-peak port operations require careful consideration as efficiency gains and travel time savings may be primarily experienced by drayage truckers (and the traveling public at large) while additional work hours are required from terminal operators. Extended hours operations could have negative impacts on the community such as nighttime noise and light pollution and these tradeoffs should also be considered when evaluating how this program could be implemented. Nevertheless, the potential benefits make the strategy merit further exploration.

A final element of this category recognizes that with the focus on PDAs 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 is a variety of innovative practices that can be applied to help manage this local traffic such as off-peak deliveries, and Alameda CTC and other agencies can provide leadership by providing guidance and funding implementation demonstrations. Table 6.2 summaries the strategies recommended for this opportunity category.

Table 6.2 Opportunity Category 2: Smart Operations and Deliveries Strategies

Project Description and Project Elements	Additional Information
Off-Peak and Novel Delivery Policy Guidance and Demonstration Program	New program to demonstrate off-peak delivery policy and incentives building on New York City research and results of FHWA off-peak delivery demonstration. Strategy also will look at mitigations for adverse impact on neighborhoods from such a program. Program could also include pilots related to neighborhood delivery pick-up and drop-off centers that reduce last-mile truck VMT.
Port of Oakland ITS, including FRATIS[a]	The Port of Oakland aspect of the project will leverage the existing communications infrastructure to implement various ITS projects in a phased deployment. The deployment will include the development of a master plan to be followed by a pilot/demonstration project. This project would interconnect the signals along these routes to minimize delay and improve traffic flow, and provide the Port and City with centralized control for incident management. Real-time traffic-responsive systems would be considered. Finally, the program could include an appointment-based arrival system whereby drayage trucks have a dedicated window to receive a container to smooth truck arrivals.
Oakland Airport Area ITS Project	Design and implementation of ITS along 98th Ave and Hegenberger Rd from I-880 to OAK such as interconnected signals and adaptive signal timing. ITS linkages would benefit OAK access to significant numbers of trucks traversing the arterial linkages to and from I-880, including many high-value air freight shipments.

[a] FRATIS is a bundle of applications that provides freight-specific dynamic travel planning and performance information and optimizes drayage operations so that load movements are coordinated between freight facilities to reduce empty-load trips. See more at http://www.its.dot.gov/dma/bundle/fratis_plan.htm#sthash.KORNJwaN.dpuf.

Project Description and Project Elements	Additional Information
Freight Guidelines for Complete Streets Initiative	This program will develop policy, funding, and recommended guidelines design of especially complicated projects in urban centers. The program could provide examples of model street treatments (such as curb pullouts for trucks in delivery zones), geometric guidance, separations of modal users in street design, time-of-day management of right-of-way, etc. Program also can consider advocacy for a federal program to conduct research on delivery vehicles suitable for urban delivery conditions (e.g., adjusted turning radii).
I-880 and I-580 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 on I-880 and potentially I-580.
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.
Strategies to Improve Port Operations, including Night Gates and Weekend Operations	This program includes adding more shifts, automation of terminal operations, and/or other gate management practices while mitigating any potential community impacts. The goal of the program would be to reduce congestion at the port during the day, which causes significant backups.
Clean Truck Policy and Program Collaborative (Joint Working Group with Regulatory Agencies, Freight Industry Representatives, and Public Agencies)	This can 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. It is a collaborative program, including participation from all relevant stakeholders.
Near-Zero and Zero Emission Goods Movement Technology Advancement Program	New 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. Program could potentially include funding to compensate smaller independent drayage truckers for whom it is not economical to upgrade trucks. Program also could include ZEV technology demonstrations for trucks and alternative fueling infrastructure.

6.3 Opportunity Category 3: Modernized Infrastructure

Support Alameda County'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 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, Alameda County still has a number of key industrial sectors that remain healthy contributors to the expanding economy. Industries such as biotechnology, artisanal food manufacturing, and precision instrument manufacturing, are all expanding in Alameda County. Capitalizing on such growth, warehousing activities in cities like Fremont are booming, and additional warehousing spaces are expected to meet future demand.[22] In addition, Alameda County is seeing growth opportunities in the application of advanced manufacturing to more traditional industries, again, taking advantage of Bay Area's well-known technology sector. These businesses continue to locate in the County's traditional industrial centers along I-880 and I-80.

While goods movement investments alone are not likely to be the key ingredient in expanding these industry sectors, viable industrial corridors with good

[22] http://www.mercurynews.com/fremont/ci_26168507/largest-speculative-industrial-development-15-years-rising-near.



6 Opportunities

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 and to continue support of existing industries. Safe and efficient truck access to and from the County's industrial corridors needs to be a critical element of the goods movement strategy.

The County's historically industrial corridors also have 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. Table 6.3 summaries the strategies recommended for this opportunity category.

Improvements at the I-580/I-680 interchange should be a priority because of the level of truck volumes, delays, and safety issues. A PSR has been conducted for a specific proposed project at this interchange, but it has been cost-estimated as very expensive and is not likely to move forward. With some funding in Measure BB, a new project will be scoped that could address the goods movement issues as well as passenger delays at this interchange.

In addition to strategies aimed directly at goods movement users, strategies such as the addition of high capacity transit in shared-use corridors like I-580 have major benefits to goods movement users. When these strategies show strong overall mobility benefits for all users, they will be included in this opportunity category.



Table 6.3 Opportunity Category 3: Modernized Infrastructure Strategies

Project Description and Project Elements	Additional Information
Land use guidelines and incentive programs to cities that reduce land use conflicts	This program will coordinate with regional and state efforts to address industrial land use planning and preservation and could address the following: technical assistance to update zoning, guidance on setting up buffer zones, including vegetated buffers, incentives to preserve buffers, identification of funding for assembling of fragmented parcels, and reduction of negative impacts on communities from freight operations.
A program of freeway interchange and auxiliary lane projects	This program will prioritize and fund projects that will modernize existing freeways by improving the flow and safety of freight traffic. Projects include interchange improvements, roadway improvements and widenings, bypasses, and roadway modifications.
A program of local street projects to improve truck route access and connectivity, including overweight routes	This program will include improvements such as lane additions, new signals, new truck route designations, and potential additions to existing overweight truck networks.
Truck route coordination planning/ guidance, technical assistance, and information to address truck route connectivity, health and community impacts	This program provides planning and technical assistance on truck route planning based on principals of connectivity and separation of truck activity from sensitive receptors, and facilitate discussion and actions by cities to adopt routes that address system gaps, as well as possible consideration for removing restrictions. Guidance would include model ordinances and polices for cities.
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 to account for 2013 driver hours of service regulations, changes in economic conditions, changes in property availability. It will then implement measures sufficient to address illegal truck parking on local streets through providing truck parking and service facilities in key industrial locations such as Hayward, Union City and Fremont.
Targeted Programs to Encourage Use of Zero Emission Trucks and Cargo Handling Equipment Particularly in the I-80, I-880, and I-580 Corridors	This program extends from the Technology Advancement program and targets freight corridors and facilities in communities with greatest adverse impacts from freight emissions. It will provide incentives to encourage the use of zero-emission trucks in those places.
Develop/support workforce training programs for goods-movement-related jobs (industry-focused logistics jobs)	A program to support workforce training for goods movement-related jobs, especially for residents of areas most affected by goods movement projects.
Countywide Freight Signage Program	This program will add route-finding signage, signage about truck parking restrictions, and signage about truck route restrictions to improve truck operations and reduce community impacts. The truck route guidance program and this freight signage program will focus on improved signage, education of truck drivers about revisions, and encouraging compliance. But enforcement is a local policing issue that this Plan does not address.
At-grade crossing safety and grade separation policy and program	This program will develop guidance for developing a countywide priority list of grade-crossing improvements and will work with local jurisdiction to identify priority projects for funding.



Chapter 7

Moving Forward

7 Moving Forward

7.1 Coordinating Partner Roles and Responsibilities

The Alameda CTC cannot effectively move forward with the Countywide Goods Movement Plan alone. This is not a unique situation – most countywide transportation plans require partnerships. However, the scope of coordinated activities that is needed to make the opportunity categories work as complete and integrated packages is substantial. Table 7.1 presents a matrix of key roles for implementation partners, illustrating the complexity of coordinating the advancement of the opportunity categories and the wide ranging partnerships that will be required. In addition to the partners noted in Table 7.1, Alameda CTC recognizes the economic and goods movement relationships it has with neighboring regions, in particular the Northern San Joaquin Valley and the Sacramento region. Partnerships with transportation planning agencies in these regions will also be important to moving forward with the Plan. The coordination issues associated with each of the Opportunity Categories are summarized below.

The Metropolitan Transportation Commission (MTC) will play a key role in helping implement this Plan. As the Bay Area MPO, MTC will help to convene stakeholders beyond Alameda County; both within the nine-county Bay Area region, as well as the mega-region of Northern California. MTC will work closely with Alameda CTC on the development of program guidelines, conducting studies relevant to this Plan, and helping fund and identify additional funding sources.

Addressing air quality and public health impacts in affected communities near goods movement infrastructure remains a necessary priority. Engaging agencies already trying to quantitatively estimate the size and scope of some of the impact reduction strategies will, thus, be an important partnership to develop. In particular, BAAQMD and the Alameda County Public Health Department (ACPHD) could take the lead as they have expertise and tools that could be used and have already initiated studies of public health outcomes in communities adjacent to transportation and goods movement facilities. Alameda CTC and MTC will work with the BAAQMD and the ACPHD to support more rigorous analysis of the relationship of goods movement activity and public health impacts. This will require improved tools to estimate the specific sources and levels of goods movement activity contributing to public health impacts. MTC is beginning a process to improve the representation of freight and truck activity in its regional transportation models and as these tools continue to improve they can be used to help improve public health impact assessments.



Table 7.1 Key Partner Roles

Alameda CTC	Port of Oakland
• 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	• Submit in response to call for projects, project delivery (projects on Port property) • Make TIGER applications if funds are available • 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)
MTC	**Private Sector and Business Organizations**
• 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 and PBA 2040 • Participate in detailed rail planning study for Port of Oakland • Conduct a detailed managed lanes study • Work with Alameda CTC to develop program guidelines for programs, such as off-peak delivery program • Work with Alameda CTC, BAAQMD, and state agencies to develop planning and land use guidelines	• 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 (EBT&LP) 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 program • EBT&LP should continue to develop community college training programs
Cities	**State Agencies**
• 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	• 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
BAAQMD	**Federal Agencies**
• 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 Alameda CTC, MTC, and state agencies to develop planning and land use guidelines	• Include in National Highway System (NHS) intermodal connector designations and provide funding for expanded intermodal connector program • Provide funding for goods movement in federal surface transportation bill and TIGER • Continue program funding for FRATIS, grade-crossing, and 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 Category 1 – Sustainable Global Competitiveness

Most of the projects at the Port of Oakland or the Oakland Global Logistics Center that are included in this category would be sponsored and executed by the Port of Oakland or the City of Oakland. Several of these projects have been environmentally cleared, and the biggest obstacle is funding. While county-level funding can help close some funding gaps, other sources will need to be pursued.

Strategies included in this category 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 reduction initiative, would need to be implemented as separate programs/projects whose execution would need to be timed to come on-line as soon as possible to address existing impacts of goods movement and to prepare for anticipated growth. The zero and near-zero emission demonstration program would likely be coordinated by the BAAQMD (with cooperation from the Port) and could be funded with Air Resources Board Cap and Trade programs under the incentives to purchase low-carbon vehicles program. Yard trucks and other equipment staying entirely within the Port could be good targets for electrification as they could remain close to charging stations. 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 currently are under environmental review. Thus, they could be implemented by the commuter rail service providers. Alternatively, they could be funded and implemented by Caltrans, or other partner agencies, as part of a new Trade Corridor Improvement Fund (TCIF) program (or the Cap and Trade program). Regardless, agreements will need to be negotiated with the UP as the owner of most of the track.

A final element of this opportunity category 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 on-going collaborative institutions. 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. Local hiring is a key aspect of Opportunity Category 1. Requirements may face legal restrictions to be overcome. As such, partners are needed to support this initiative, such as East Bay Economic Development Alliance (EBEDA) and similar agencies. Efforts should be made early in implementation to investigate mechanisms to support local hiring.

Taking all of this into account, there are three main approaches that could be pursued to address challenges that are raised by this opportunity category:

- **Develop a formal institutional framework for coordination.** A formal institutional framework would define the roles and responsibilities of all implementing agencies, would specify project priorities and likely timing, would 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 category that are within their jurisdiction. The framework also would 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:

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 multi-jurisdictional 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.

  - » Create a Joint Powers Authority that would allow the partners to delegate authority and provide responsibility for delivering the entire program to it.
  - » Create a Memorandum of Understanding (MOU) among the partners that will spell out the specific responsibilities for project delivery and target funding contributions. The Freight Action Strategy (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 a project deliver agencies.

- **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.

7.1.2 Opportunity Category 2 – Smart Operations and Deliveries

The Smart Operations and Deliveries opportunity category generally consists of relatively low-cost technology and operations strategies.

The highway and port ITS projects will usually only involve one or two parties for funding and implementation, and there are existing programs and models for development and delivery of these projects, such as the federal FRATIS demonstration program. These

also are projects that can be implemented in the short run. It could be possible to put together a small program from Measure BB funds to provide for project scoping studies, and then to tap existing ITS program funds for later stage implementation.

The zero and near-zero emission collaborative and the technology advancement program could be lead by the BAAQMD, since actual technology development support would be likely to come from their funding sources. However, there is a model from Southern California that could be an appropriate coordination tool to consider for this 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, California Department of Transportation (Caltrans), the regional Metropolitan Planning Organization (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 Alameda CTC with similar partner agencies and goals.

7.1.3 Opportunity Category 3 – Modernized Infrastructure

Like Opportunity Category 2, the Modernized Infrastructure Opportunity Category is less complex than Opportunity Category 1. One of the biggest implementation issues for these types of projects is encouraging cities and Caltrans to initiate project development activities for projects that address the needs identified in the Appendix H. Needs Assessment report. The most effective way of ensuring this is to include consideration of the way a project addresses goods movement needs as part of the project selection criteria in future calls for projects. This can be considered as part of the Comprehensive Investment Plan (CIP). Alameda CTC also could try to carve out a small pot of money from existing funds to support initial planning and scoping of new projects that address identified needs and work with the cities to develop these projects.

7.2 Public-Private Partnerships (P3)

The strategies presented in the opportunity categories provide several opportunities for public-private partnerships for funding and delivering projects. The projects at the Oakland Global Logistics Center Phase 1 are examples of public-private partnerships that support goods movement, and there should be similar opportunities for the Phase 2 projects that are included in the Sustainable Global Competitiveness opportunity category. 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 the Sustainable Global Competitiveness Opportunity Category is partnerships with the railroads, more specifically with 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.

One approach to public-private partnerships with the railroads that has worked in some instances is for the public sector to provide funding for projects that have private benefits, but where the return on investment (ROI) for the project is not as attractive as when compared to other capital investments, they can make in other parts of their system. This is an approach that has been used in the ConnectOregon program that Oregon DOT uses to fund nonhighway projects, and that the UP considers to be one of the better models of public-private cooperation in the country.

While this model of public-private cost-sharing for a well-defined project, the challenge presented by the Sustainable Global Competitiveness Opportunity Category is that not only does it look to the railroad to provide investment capital, but it also anticipates changes in operating practices. The railroad also might be reluctant to sign any agreement that did not contain some flexibility in the case the real benefits turn out to be below projected levels.

While these challenges are large, the following elements could support moving this category 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; and
- **Involve** the State Transportation Agency and the Governor's office to put the needs of Alameda County 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 Funding Gaps

Table 7.2 presents high-level estimated costs of the Countywide Goods Movement Plan. These cost-estimates are based on submitted cost-estimates for projects that responded to the Countywide Transportation Plan Call for Projects; project cost-estimates from other plans (Plan Bay Area,[23] the California State Rail Plan) for projects that were not submitted in response to the call for projects; and estimates for programs that provide funding for a modest number of projects or project scoping based on similar programs in other jurisdiction or sample projects of a similar nature. The table also provides an estimate of committed funds for these projects in order to provide an estimate of funding needed to implement the goods movement projects.

[23] Plan Bay Area is the latest Bay Area Regional Transportation Plan completed in December 2013.

Table 7.2 Cost of Projects and Programs by Category, *Million Dollars*

Category	Total Cost	Programmed Funding	Funding Shortfall
Gateway Infrastructure	1,255	283	971
Highway Interchange Improvements	221	177	44
Rail infrastructure capacity improvements	375		375
Technology Programs (highway, ITS, zero-emission)	331	13	312
Local Truck Route Improvements	362	112	249
Goods Movement Planning Support	13		13
Impact Reduction Programs	895		895
Total	**3,451**	**587**	**2,864**

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. However, as can be seen from the table, there is a significant funding gap as available sources of funding are not likely to be sufficient to fund all of the projects. The remainder of this section describes funding sources that could be used for projects and programs, and some of the issues and challenges associated with these funding sources. These funding sources, the amount of money available, and issues/limitations associated with their use are summarized in Table 7.3. One of the issues that becomes apparent from a close examination of the funding sources is the limited available funding for nonhighway projects. This may be one of the most critical areas for future advocacy by Alameda County goods movement stakeholders. There are promising new sources of funding to address environmental and public health impacts of goods movement in communities that can be used to fund programs, such as the ZEV incentive programs. However, there will be substantial competition from Southern California and San Joaquin Valley projects. A coalition of affected regions and community groups to lobby the state legislature for additional funds for these programs also should be a target for advocacy. Efforts to identify specific eligible projects that would implement the strategies of the Opportunity Categories should begin immediately and partnerships formed to apply for these funds.

7.3.1 Measure BB Transportation Expenditure Plan

At the county level, there is funding of more than $2.6 billion, for which freight projects could compete. However, the amount of funding for the largest rail and Global Gateway projects in Opportunity Category 1, which constitute unfunded need of $971 million, are only eligible for local funding of $348.4 million, and only $238 million of these are reserved for goods movement projects. The need to identify significant, dedicated freight funding for these projects is critical to the success of the Goods Movement Plan.

For Opportunity Category 2 and the zero and near-zero emission elements of Opportunity Categories 1 and 2, there are $77.4 million for Technology, Development, and Innovation that could be leveraged with other state and federal funding.

7.3.2 Regional Funding Sources

As the regional agency MTC is responsible for preparing the RTP, which is a long-range plan expressing regional transportation priorities. There is presently no dedicated goods movement funding program that is managed and programmed at the regional level. Goods movement programs and projects must, therefore, be eligible under other criteria and reflect the other broad regional transportation priorities in order for them to have the greatest likelihood of being funded by MTC with its programming authority. MTC adopted a $400 million freight program in 2013 that it expected to use Cap and Trade funds for, but these funds remained at the state level. In the 2013 version of Plan Bay Area (PBA), MTC reported that of the $292 billion in revenues available over the 28-year life of the plan, $232 billion already are committed to existing projects and programs and only $60 billion were for discretionary spending. An even smaller portion of this $60 billion is actually programmed by MTC, and a significant component of the discretionary funding is designated for transit capital and operating programs, pavement and bridge maintenance, and other uses for which goods movement projects would not be eligible. With all of these limitations, it is critical to align goods movement projects with other regional priorities, and to determine where goods movement projects can compete effectively for funding available within existing funding programs that MTC manages and has programming authority.

One of the most important funding programs at the regional level that could fund some of the goods movement programs is the One Bay Area Grant (OBAG) program. A substantial fraction of the OBAG money is distributed directly to the county Congestion Management Agencies, and Alameda CTC could theoretically use some of its allocation to fund goods movement projects. However, the focus of these funds is on projects in Priority Development Areas (PDA).

Table 7.3 Summary of Existing and Potential Future Goods Movement Funding Sources, *2016-2040*

Revenue Source	Description	Total Value (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.
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.

Revenue Source	Description	Total Value (Millions)[a]	Eligible Uses Relevant to Goods Movement
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.
Cap 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. 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.	$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.
Future/Anticipated			
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.

Revenue Source	Description	Total Value (Millions)[a]	Eligible Uses Relevant to Goods Movement
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 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.	$560[e]	TBD, but this is not a freight-specific source. However, the amount listed is our assumption for how much funds would go towards freight-specific projects.
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.
U.S. DOT TIGER funds	Discretionary Federal grants awarded to fund capital investments in surface transportation infrastructure that will have a significant impact on the Nation, a region, or a metropolitan area. Funds have been appropriated for a 2016 TIGER program, but the program is not renewed in the FAST Act.	$500 million awarded in October 2015. Of this, $220 million went to freight projects.[j]	Port, rail, and highway projects benefiting freight transportation. (Other non-freight-specific projects also eligible under this source.)

[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 only 10% of the total from this source in Plan Bay Area 2040 Draft Revenue forecast, which we take as our assumption for the portion that can be expected to go towards freight-specific projects.

[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.

Aside from the OBAG funds, there are state funds approved by the California Transportation Commission and programmed through the STIP that also might be potential funding sources for the freeway and interchange improvements in Opportunity Category 3. Because this is a major funding source for highway projects that are not goods movement projects, these are not included in the funding tables.

Finally, the region also is considering adopting a new regional funding measure (RM3) that would be funded with increase in bridge tolls. Authorizations for the measure would have to be sought through new legislation to the extent that the proceeds of the measure could be used for any types of projects in the opportunity categories.

7.3.3 California Cap-and-Trade Funds

The State's Cap and Trade program is becoming an increasingly important revenue source to fund programs that transition to low-carbon transportation technologies and modes, and the auctions that generate the revenue for these programs have dramatically exceeded expectations. The Governor's initial budget forecast for FY 2015 and 2016 was for $992 million, but this was since revised to more than $2.5 billion (assuming an average of $100 million per year through 2040). Roughly 60 percent of the funding is continuously appropriated based on an agreed-upon framework, and the remaining 40 percent are allocated through discretionary programs. The financial assumptions for the PBA update that will be completed in 2017 assumes that approximately 5 percent 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.

The low-carbon vehicle purchase incentives will clearly be an important component of this plan's zero and near-zero emission truck strategies. Efforts to secure these funds for Bay Area projects should continue to be coordinated by the BAAQMD, guided by the principles embodied in this plan. It should be noted that any vehicle requirements may place special burden on independent owner operators and special funds should be made available to them so as not to bankrupt them in competition with better-capitalized large fleets. However, from an impact reduction perspective (scale of impact), it is important to incentivize the larger fleets to adopt cleaner technology as rapidly as possible.

7.3.4 Interregional Transportation Improvement Program (ITIP)

The ITIP is a set-aside of 25 percent of the STIP that is programmed based on priorities outlined in the Interregional Transportation Strategic Plan. I-80, I-238, I-580, I-680, and I-880 in Alameda County are all interregional corridors that are potentially eligible for ITIP funding.

7.3.5 Other Federal Programs (non-STP/Congestion Mitigation and Air Quality Improvement (CMAQ)

The federal government offers little funding to freight programs under current legislation. Some federal funding is available under the Highway-Rail Crossings (Section 130) program to make at-grade-crossing improvements (including grade separations), although the amounts of funding are small. The Railroad Rehabilitation and Improvement Fund (RRIF) program provides modest credit assistance to make track improvements although in the current low-interest rate environment, it is unlikely that this would be an attractive option for financing the rail improvements recommended for this plan.

The main source of federal funding for freight projects since 2009 has been the TIGER grant program. This is a discretionary grant program under which the U.S. Department of Transportation (DOT) has provided partial funding for port, rail, and highway projects benefiting freight transportation. Projects at the Oakland Global Logistics Center already have been recipients of TIGER funding. The program is subject to

annual appropriations, but due to its popularity is likely to be continued in the range of $400 million to $500 million per year. Alameda CTC can target TIGER funding for bigger projects. It is possible the TIGER program may change with a new federal surface transportation bill, but Alameda CTC can pursue other future federal options that support goods movement.

The federal government also provides credit assistance to large transportation projects through the Transportation Infrastructure Finance and Innovation Act (TIFIA) program. This program provides low-interest loans, loan guarantees, and other forms of credit assistance to projects with eligible costs of at least $50 million. This can be beneficial for projects that have a revenue stream that can be used to pay the loans.

7.3.6 New State Funding Sources – Extraordinary Transportation Session

One of the most important funding programs for goods movement in California has been the TCIF, which was originally funded through the 2006 Proposition 1B bond initiative. 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. Recently, the legislature made TCIF a permanent program, but has not appropriated any new money.

The State legislature continues to consider various TCIF funding proposals. There is likely to be continued interest in establishing new on-going funding for goods movement via TCIF, and this could once again be an important program to provide funding for projects with statewide significance. As of the writing of this plan, no state action has been taking to increase TCIF funding.

7.3.7 Fixing America's Surface Transportation (FAST) Act

In December 2015, Congress passed and the President signed the Fixing America's Surface Transportation (FAST) Act, ending the period of extensions of the past federal surface transportation act and creating a new, long-term funding program for the nation's transportation system. The FAST Act provides multiple funding sources that could be used for the projects and programs identified in this plan.

The first is through freight-specific funding programs. The FAST Act contains two main programs that fund freight projects. The first is the Nationally Significant Freight and Highway Projects Program (NSFHPP). The NSFHPP program is a $4.5 billion program over five years that consists of competitive grants. Projects can receive up to $100 million, and a total of $500 million is set aside for port, rail, and intermodal projects. This funding is intended for large freight investments that have national significance. While funds can be used for projects on the National Highway System even if they are not on the National Freight Network, it is likely that priority will be given to projects on the National Freight Network, which includes the key interregional corridors of I-80, I-880, and I-580.

The second freight-specific funding program is the National Highway Freight Program (NHFP). The NHFP is a $6.3 billion program over five years that will be apportioned between the states by formula based on the number of Primary Highway Freight System miles in the state.[24] Beyond a set aside (10 percent) for rail and intermodal projects, the NHFP will fund projects that are located on the National Highway Freight Network which has four components:

- The Primary Freight Highway system;
- Critical Urban Freight Corridors (75 miles statewide or 10 percent of State's Primary Highway Freight System, whichever is greater);
- Critical Rural Freight Corridors (up to 150 miles or 20 percent of the Primary Highway Freight System, whichever is greater); and
- The remainder of the Interstate Highway System.

[24] The Draft Comprehensive Freight Network developed by the FHWA under MAP-21 forms the basis for the apportionment. California has 3,117.7 miles on that network, approximately 7.5 percent of the total. http://ops.fhwa.dot.gov/freight/infrastructure/pfn/state_maps/states/california.htm.

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Because California's Primary Highway Freight System represents more than two percent of the national total, NHFP funds cannot be used on the fourth category – the remaining Interstate System – unless the section of Interstate is included under one of the other three categories.

Goods movement also can be enhanced by projects funded through other sources in the FAST Act; many of which are a continuation of MAP-21 programs. Many of the priority projects identified above that are not explicitly freight related could be considered for funding through these "general" highway programs. For example, safety improvements that benefit both trucks and passenger vehicles (such as a truck climbing lane) or projects that reduce heavy-truck delay, reducing idling and decreasing greenhouse gas emissions, could obtain some funding from these sources, which include National Highway Performance Program (NHPP), Congestion Mitigation and Air Quality (CMAQ) Program, Highway Safety Improvement Program (HSIP), and the Surface Transportation Program (STP), which has been modified to become the Surface Transportation Block Grant Program (STBGP). STBGP funding is flexible and could be used for a number of programs, including ITS and Freight Parking, though competition will be high.

Finally, "innovation" is a theme found throughout the FAST Act and one program under that heading could provide funding for freight projects. The FAST Act provides $60 million per year for an Advanced Transportation and Congestion Management Technologies Deployment Program. This competitive grant program will focus on the development of pilot projects and model deployment sites for the installation and operation of advanced transportation technology. There may be opportunities to combine needs and seek funding from multiple sources. For example, the federal emphasis on truck parking could be combined with an ITS component, such as real-time space availability, to address multiple federal priorities and increase the chance of receiving funds.

Table 7.4 below shows California's share of federal FAST Act money in different programs over the next five years.

Table 7.4 California Funding from FAST Act, *Millions Dollars*

	NHPP	National Freight	Metropolitan Planning	STP	HSIP	TAP	Railway-Highway Crossings	CMAQ
FY 2016	1,924.7	106.3	49.8	894.1	195.5	74.7	15.7	462.2
FAST Act 5-year annual average	2,006.5	116.5	52.0	936.1	203.5	75.5	16.2	481.4
FAST Act FY 2016-2020 Total	**10,032.5**	**582.4**	**259.8**	**4,680.5**	**1,017.6**	**377.3**	**82.1**	**2,407.0**

Source: http://www.dot.ca.gov/hq/transprog/map21/reauthorization/ca-fedtranliaison-fastactmemo.pdf.

7.4 Creating New Programs

The opportunity categories 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:

1. 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.
2. Conducting more detailed scoping studies to identify specific projects that would ultimately receive design and construction funding through larger program allocations in future plans.
3. 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 Southern California Association of Governments (SCAG) region has proven successful.[25]

7.5 Keeping the Collaborative Going

There are a number of reasons why an on-going collaborative will be important for the success of the Alameda Countywide 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 regional, state, and federal agencies.

Several models from other states and regions are presented for consideration in the following Sections.

7.5.1 Multilevel 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 included collaborative advocacy for funding and increased visibility of Southern California gateway needs. In order to implement the collaborative a Memorandum of Understanding was signed by all of the partners. This MOU is included in Appendix A. FAST Corridor (Freight Action Strategy partnership) Memorandum of Understanding.

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

[25] http://rctc.org/uploads/media_items/rctc-gradecrossing-priorityreport-final-withappendix-040612.original.pdf.

1. 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.

2. 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.[26]

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 that 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. For more information visit the Puget Sound Regional Council web site http://www.psrc.org/about/advisory/roundtable/.

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

[26] For more information about the Southern California National Freight Gateway, contact Annie Nam at the Southern California Association of Governments or visit the FreightWorks web site http://www.freightworks.org/Pages/default.aspx.

make significant capital and operational improvements to the Chicago rail network with is shared by all of the nation's Class 1 carriers, Amtrak, and the Metra commuter rail system. Infrastructure was getting out of date and unreliable and coordinating operations among the many parties who own and operate the system was becoming more complex and difficult. Public transportation agencies and civic groups were concerned about the spillover affect 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. Making rational investments to improve the overall efficiency of the system proved very difficult because there was so much shared infrastructure making it difficult to get any individual railroad to take responsibility for paying for improvements that could benefit competitors. 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 emerged. Mayor Richard Daly 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. 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:

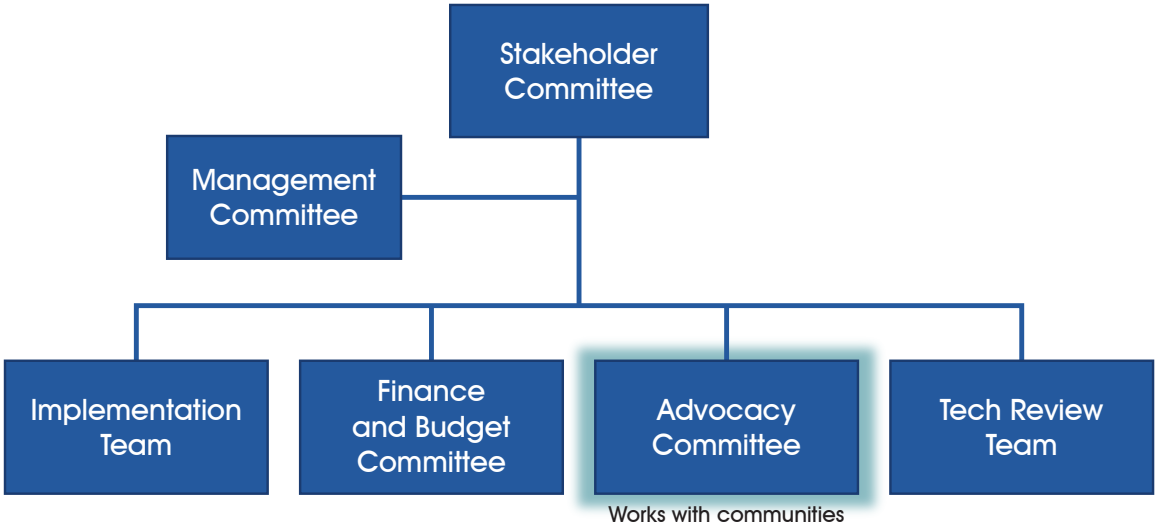
- **Stakeholder Committee.** The Stakeholder Committee has three members: President and CEO of the Association of American Railroads (AAR), Chicago Department of Transportation (CDOT) Commissioner, and Illinois Department of Transportation (IDOT) Secretary. This committee sets policy for the CREATE program and approves any changes in scope or budget. This committee provides final resolution on all stakeholder issues and makes decisions by unanimous agreement.
- **Management Committee.** The Management Committee is comprised of one member from Chicago Transportation Coordination Office (CTCO), Metra Commuter Rail (Metra), Burlington Northern Santa Fe Railway (BNSF), Canadian National (CN), Canadian Pacific (CP), CSX Railroad (CSX), Norfolk Southern (NS), Union Pacific (UP), AAR, CDOT, and IDOT, as well as nonvoting members from Amtrak, Belt Railway of Chicago (BRC), Indiana Harbor Belt Railroad (IHB), and FHWA. This 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. The committee makes decisions by unanimous agreement, although any member may elevate an issue to the Stakeholder Committee. The Management Working Group is formed of one representative from each of the three stakeholder agencies (AAR, CDOT, and IDOT) who work out any issues that may arise. If it cannot resolve the issue, or if something needs formal approval, it goes to the full Management Committee.

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- **Implementation Team.** The Implementation Team is comprised of one member from the following entities: CTCO, Amtrak, Metra, BNSF, CN, CP, CSX, NS, UP, BRC, IHB, AAR, CDOT, and IDOT. The Implementation Team tracks budget and construction progress and recommends project changes. Members are mainly from the Engineering/Operations divisions of their agencies. This committee meets every month – one day with consultants, who present monthly progress reports on their projects, and the next day by itself.
- **Finance and Budget Committee.** The Finance and Budget Committee comprises one member from the following entities: CTCO, Amtrak, Metra, BNSF, CN, CP, CSX, NS, UP AAR, CDOT and IDOT and reports to the Management Committee. This 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 comprised of one member from the following entities: CTCO, Amtrak, Metra, BNSF, CN, CP, CSX, NS, UP, AAR, CDOT, and IDOT and reports to the Management 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. It also informs and coordinates with engineering and construction companies about contracting issues and hiring in the communities where projects will be constructed.
- **Tech Review Team.** This team is comprised of one member each from the railroads, IDOT, and CDOT and reports to the Implementation 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

CREATE Organization



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. For more information, visit the CREATE web page http://create-program.org/index.htm.

7.5.4 A Plan for the Bay Area

None of the collaborative models described previously has all of the features that would be desirable for a continuing Goods Movement Collaborative for the Bay Area. But some combination of important features from all of these models could be useful moving forward. These 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 categories.
- A memorandum of understanding or some statement of understanding, while not necessarily legally binding, does provide an indication of a stronger level of commitment and provides more of a roadmap as to 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 has, will be critical for an on-going collaborative in Alameda County.
- An on-going 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 provides for a level of active engagement of the community in the collaborative process, and this seems to be a significant shortcoming that would need to be overcome before adopting any of these models. This is a critical need for any long-term collaborative program in the Bay Area. There are several ways that this could be accomplished:

  - » Continue to build from the existing Roundtable structure, but make sure that 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 categories.



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