

# SAN FRANCISCO BAY AREA GOODS MOVEMENT PLAN

## ***Draft Final Report***

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*prepared for*

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# 1.0 Introduction

## 1.1 Background and Context

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

- **Changes in industry mix and downward pressure on middle wage jobs.** The economy has shifted away from manufacturing and warehouse and distribution industries that dominated the goods movement picture in the last century and has moved towards technology and knowledge-based industries. This change in the economy has reduced opportunities for workers in middle-wage occupations with low educational barriers to entry.
- **Changes in land use development patterns and the location of goods distribution facilities.** The region was an early leader in promoting Smart Growth and new urban forms. In recent years there has been a growing focus on planning for compact development in Priority Development Areas adjacent to transit. This can create redevelopment pressure in older industrial centers, leading to conflicts between goods movement and passenger transportation modes on congested roadways and rail lines. As land values have risen, much of the region's distribution network for serving consumer demands has moved to the northern San Joaquin Valley and northern Nevada. This is exacerbating congestion and safety conditions on the region's interregional highways.
- **Urgency to address environmental justice issues while reducing greenhouse gas (GHG) emissions.** Along with the region's concern over housing affordability comes an overarching concern about equity in land use and transportation decisions. The region's major goods movement corridors and facilities tend to be concentrated in close proximity to communities where environmental justice concerns are significant and continued investment in goods movement in these corridors must minimize impacts on these communities. At a broader level, the region continues to pursue strategies to address climate change and environmental sustainability goals as a core component of its transportation plans. This will require new approaches and new technologies for goods movement.

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

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

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

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

- **Relies on smarter operations, technology, and land use strategies to increase the efficiency of the goods movement system.** Future goods movement planning will need to emphasize efficiency, demand management, and multimodal approaches, similar to how the region now plans for its passenger system. Technology and “smart” operations will be at the center of future goods movement strategies. Freight intelligent transportation systems (ITS), “connected” vehicles, and zero and near-zero emission vehicles will be important elements of the future goods movement system in the Bay Area. This represents another public-private partnership opportunity to engage the region’s innovation sectors in helping to bring these new technologies to the marketplace. Goods movement hubs and corridors in the region will continue to require attention to the equity implications of growth in goods movement activity. The goods movement plan addresses impacts on communities through strategies such as zero and near-zero emission technology, changes in land use and truck route planning, and improvements in goods movement efficiency.
- **Makes strategic investments to reduce congestion, improve reliability, and increase safety at international gateways and along primary travel corridors.** The region’s seaports and airports continue to play an important role for businesses and consumers throughout Northern California and neighboring states. These facilities are often congested and inefficient. Connections to freight hubs via the region’s major highway and rail corridors are also congested and in need of modernization. When making investments in these systems, the region will have limited resources and must invest strategically with an understanding of how demand patterns will continue to change and where public and private investments can be leveraged in order to achieve the greatest public benefits. Like the private sector has done in making decisions to rationalize private rail and trucking networks, the public sector must invest selectively and strategically.

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

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

## 1.2 Plan Development Approach and Purpose

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

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

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

- Focuses the strategies on key opportunities for the region that take advantage of its unique characteristics; and
- Develops short- and long-term recommendations for how to work with partners throughout the Bay Area to advance the Plan and advocate for the policies and funding needed from state and Federal partners.

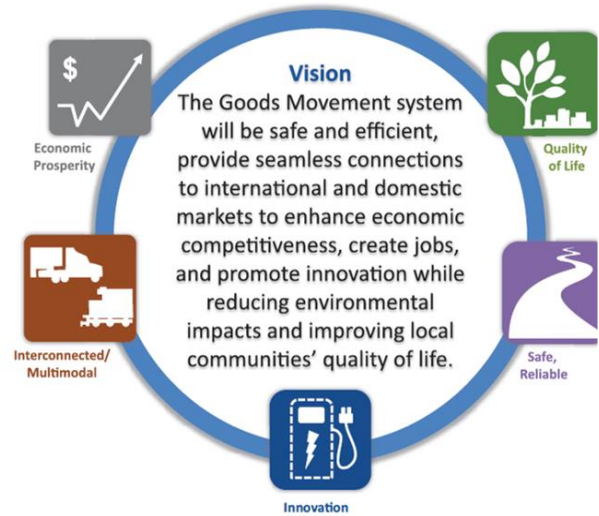
This update to the regional Goods Movement Plan benefited significantly from a parallel process commissioned by the Alameda County Transportation Commission (CTC) for their own Alameda County Goods Movement Plan. Much of the region's goods movement infrastructure is located in Alameda County and this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

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

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

## 2.0 Challenges and a Vision for the Future

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



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

### 2.1 Goods Movement Goals and Challenges

#### 2.1.1 Quality of Life

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

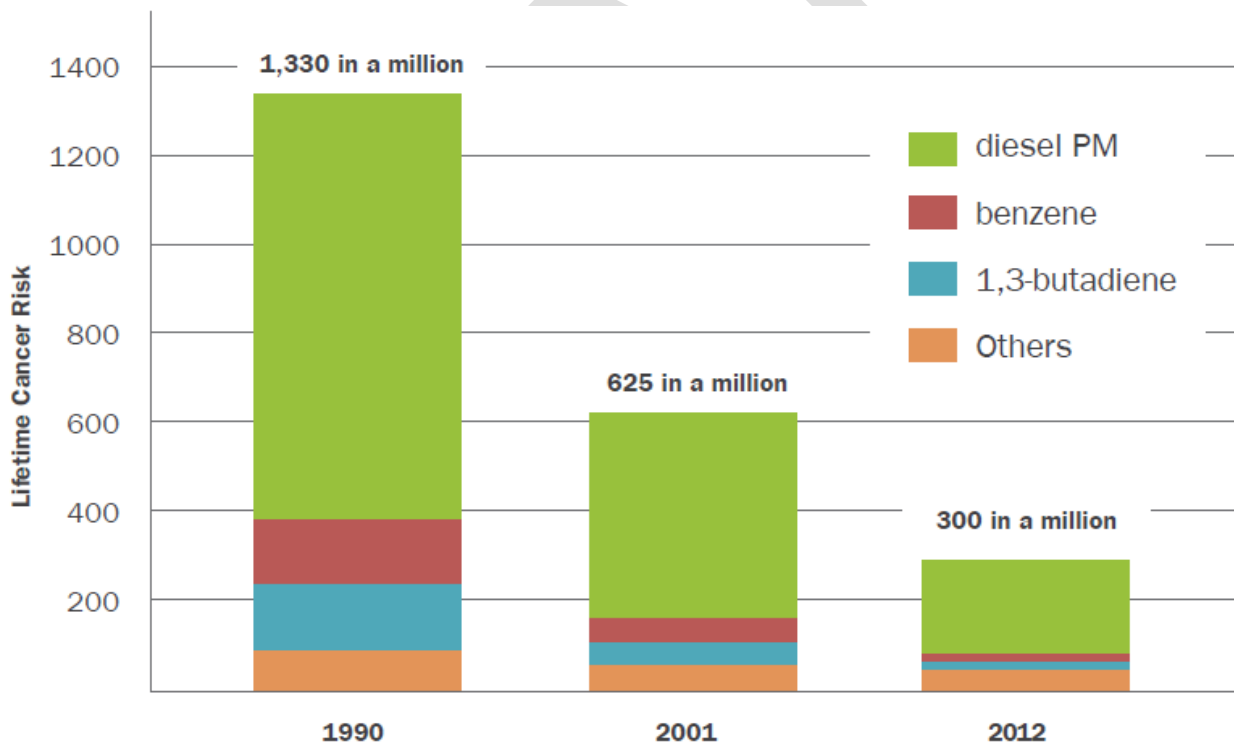
The Bay Area serves as a national leader in identifying and implementing strategies to improve public health by reducing air pollution and improving water quality, strategies to protect the environment and infrastructure by reducing GHGs, and preparing for sea-level rise and significant weather events.

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

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

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

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



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

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



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

### *2.1.2 Safety and Reliability*

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

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

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

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

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



### 2.1.3 Innovation

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

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

### 2.1.4 Interconnected and Multimodal

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

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

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

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

Another emerging area of transportation planning that represents potential opportunities for a connected, integrated goods movement system is Complete Streets. A Complete Streets approach involves, planning, designing, and operating transportation facilities and networks to serve all modes and all users. Complete Streets designs frequently seek to make streets more



**Complete streets concepts can be applied to industrial districts.**

Source: Alameda CTC, 2012.

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

### 2.1.5 Economic Prosperity

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

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

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

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

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

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

## 2.2 Goods Movement Opportunities

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

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

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

- **Smart Deliveries and Operations.** Many aspects of the Bay Area's surface transportation system are largely built out, with limited opportunities to build new capacity through added lanes or new corridors. Thus, the region has an opportunity to support maximum use of ITS, connected vehicles, and other technology solutions to more efficiently use existing roadway capacity. This opportunity can be broadened to encompass new technologies and operating practices that will lead to a more sustainable freight system, as well as innovative practices that can help manage local traffic and reduce conflicts. Elements of this opportunity package will take advantage of the innovation economy and technology sectors in the Bay Area, making them an integral provider of the systems that will be needed to advance the strategies included in this package.
- **Modernizing Infrastructure.** The continued growth in traffic is putting additional pressure on goods movement infrastructure which supports a mix of traditional, as well as emerging industries. Modernizing the backbone of the freight infrastructure is thus an opportunity that should continue to be at the heart of the goods movement plan. This opportunity should focus on modernizing the road network in industrial corridors, improving safe access to industrial corridors and facilities, reducing land use conflicts along freight corridors, and improving last-mile truck routes and rail connections to existing and emerging industries.